



Full wwPDB NMR Structure Validation Report ⓘ

Mar 10, 2026 – 01:11 PM UTC

PDB ID : 1YSX / pdb_00001ysx

Title : Solution structure of domain 3 from human serum albumin complexed to an anti-apoptotic ligand directed against Bcl-xL and Bcl-2

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Deposited on : 2005-02-09

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
Mogul	:	2022.3.0, CSD as543be (2022)
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
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

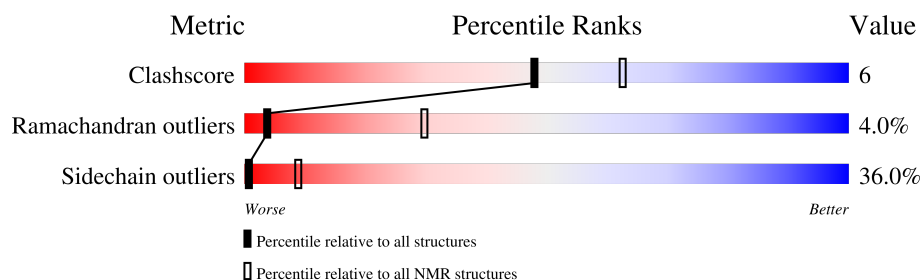
1 Overall quality at a glance

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	201	

Ideal geometry (proteins) : Engh & Huber (2001)
 Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
 Validation Pipeline (wwPDB-VP) : 2.49

2 Ensemble composition and analysis ⓘ

This entry contains 1 models. Identification of well-defined residues and clustering analysis are not possible.

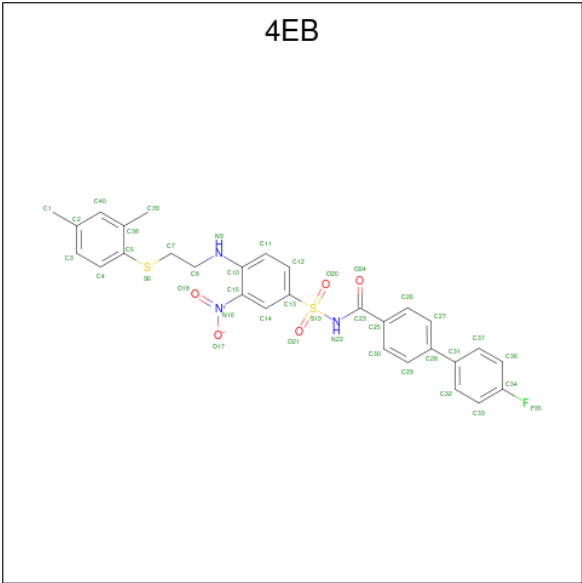
3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 3244 atoms, of which 1631 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Serum albumin.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	200	3178	990	1605	270	299	14	0

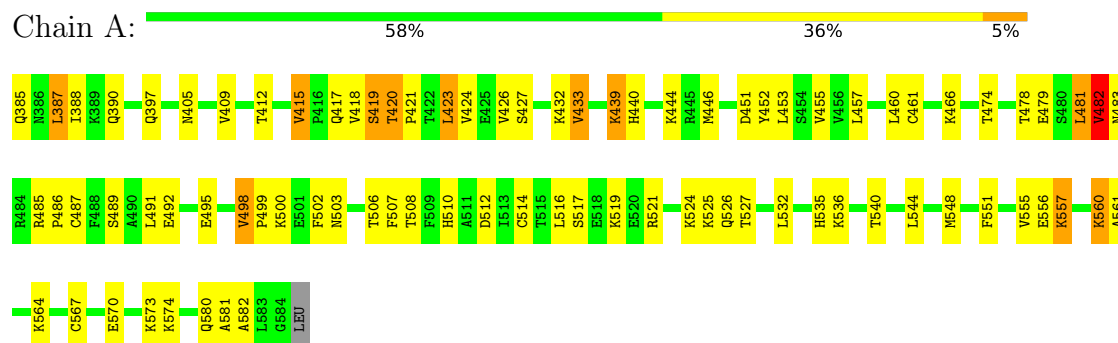
- Molecule 2 is 4-({2-[(2,4-DIMETHYLPHENYL)SULFANYL]ETHYL}AMINO)-N-[(4'-FLUORO-1,1'-BIPHENYL-4-YL)CARBONYL]-3-NITROBENZENESULFONAMIDE (CCD ID: 4EB) (formula: C₂₉H₂₆FN₃O₅S₂).



4 Residue-property plots [i](#)

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: Serum albumin



5 Refinement protocol and experimental data overview ⓘ

The models were refined using the following method: *simulated annealing*.

Of the ? calculated structures, 1 were deposited, based on the following criterion: ?.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
X-PLOR	refinement	3.1

No chemical shift data was provided.

6 Model quality ⓘ

6.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 4EB

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	1573	1605	1604	19
2	A	40	26	26	2
All	All	1613	1631	1630	19

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 6.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:551:PHE:O	1:A:555:VAL:HG12	0.59	1.98
1:A:412:THR:HG22	1:A:423:LEU:HD13	0.55	1.78
1:A:420:THR:O	1:A:424:VAL:HG23	0.52	2.04
1:A:415:VAL:HB	1:A:418:VAL:HG11	0.51	1.83
1:A:478:THR:O	1:A:478:THR:HG23	0.50	2.06
1:A:557:LYS:HE3	1:A:561:ALA:HB2	0.50	1.84
1:A:452:TYR:CD1	1:A:453:LEU:N	0.45	2.85
1:A:433:VAL:CG2	1:A:452:TYR:CD2	0.44	3.00
1:A:415:VAL:O	1:A:418:VAL:HG22	0.44	2.11
1:A:482:VAL:O	1:A:482:VAL:HG13	0.44	2.13
1:A:387:LEU:C	1:A:387:LEU:HD23	0.44	2.38
1:A:581:ALA:O	1:A:582:ALA:HB2	0.43	2.13

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:498:VAL:N	1:A:499:PRO:CD	0.42	2.83
1:A:426:VAL:CG2	2:A:1000:4EB:H8	0.41	2.44
1:A:426:VAL:CG1	2:A:1000:4EB:H8	0.41	2.44
1:A:426:VAL:HG23	1:A:427:SER:N	0.41	2.30
1:A:420:THR:N	1:A:421:PRO:CD	0.41	2.83
1:A:485:ARG:N	1:A:486:PRO:CD	0.40	2.84
1:A:452:TYR:CD1	1:A:452:TYR:C	0.40	3.00

6.3 Torsion angles [i](#)

6.3.1 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 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	198/201 (99%)	163 (82%)	27 (14%)	8 (4%)	4	30
All	All	198/201 (99%)	163 (82%)	27 (14%)	8 (4%)	4	30

All 8 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	419	SER
1	A	439	LYS
1	A	481	LEU
1	A	482	VAL
1	A	507	PHE
1	A	517	SER
1	A	526	GLN
1	A	560	LYS

6.3.2 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 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	178/179 (99%)	114 (64%)	64 (36%)	1	9
All	All	178/179 (99%)	114 (64%)	64 (36%)	1	9

All 64 residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	385	GLN
1	A	387	LEU
1	A	388	ILE
1	A	390	GLN
1	A	397	GLN
1	A	405	ASN
1	A	409	VAL
1	A	415	VAL
1	A	417	GLN
1	A	419	SER
1	A	420	THR
1	A	423	LEU
1	A	432	LYS
1	A	433	VAL
1	A	439	LYS
1	A	440	HIS
1	A	444	LYS
1	A	446	MET
1	A	451	ASP
1	A	455	VAL
1	A	457	LEU
1	A	460	LEU
1	A	461	CYS
1	A	466	LYS
1	A	474	THR
1	A	479	GLU
1	A	481	LEU
1	A	482	VAL
1	A	483	ASN
1	A	487	CYS
1	A	489	SER
1	A	491	LEU
1	A	492	GLU
1	A	495	GLU
1	A	498	VAL
1	A	500	LYS

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Mol	Chain	Res	Type
1	A	502	PHE
1	A	503	ASN
1	A	506	THR
1	A	508	THR
1	A	510	HIS
1	A	512	ASP
1	A	514	CYS
1	A	516	LEU
1	A	519	LYS
1	A	521	ARG
1	A	524	LYS
1	A	525	LYS
1	A	527	THR
1	A	532	LEU
1	A	535	HIS
1	A	536	LYS
1	A	540	THR
1	A	544	LEU
1	A	548	MET
1	A	556	GLU
1	A	557	LYS
1	A	560	LYS
1	A	564	LYS
1	A	567	CYS
1	A	570	GLU
1	A	573	LYS
1	A	574	LYS
1	A	580	GLN

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

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds for which Mogul statistics could be retrieved, the number of bonds that are observed in the model and the number of bonds that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length is the number of standard deviations the observed value is removed from the expected value. A bond length with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the average root-mean-square of all Z scores of the bond lengths.

Mol	Type	Chain	Res	Link	Bond lengths		
					Counts	RMSZ	#Z>2
2	4EB	A	1000	-	43,43,43	1.51	3 (6%)

In the following table, the Counts columns list the number of angles for which Mogul statistics could be retrieved, the number of angles that are observed in the model and the number of angles that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond angle is the number of standard deviations the observed value is removed from the expected value. A bond angle with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the average root-mean-square of all Z scores of the bond angles.

Mol	Type	Chain	Res	Link	Bond angles		
					Counts	RMSZ	#Z>2
2	4EB	A	1000	-	56,61,61	1.71	7 (12%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	4EB	A	1000	-	-	0,28,30,30	0,4,4,4

All bond outliers are listed below. They are sorted according to the Z-score.

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1000	4EB	C13-S19	5.11	1.84	1.76
2	A	1000	4EB	C23-N22	4.73	1.33	1.39
2	A	1000	4EB	S19-N22	4.66	1.75	1.64

All angle outliers are listed below. They are sorted according to the Z-score.

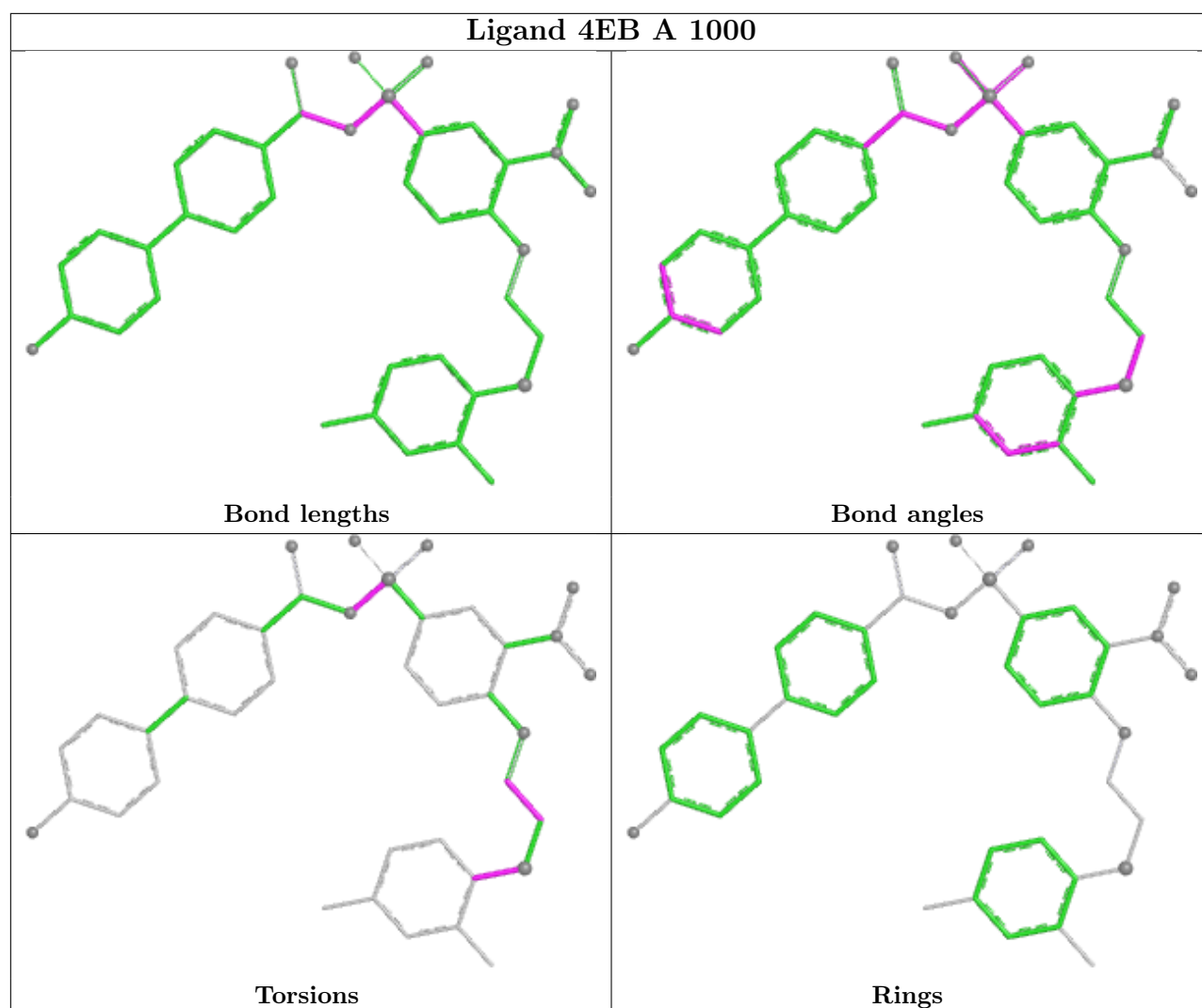
Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1000	4EB	O21-S19-O20	8.69	108.97	119.52
2	A	1000	4EB	C25-C23-N22	3.27	119.98	116.08
2	A	1000	4EB	C7-S6-C5	3.07	109.44	103.05
2	A	1000	4EB	C23-N22-S19	2.57	120.01	123.38
2	A	1000	4EB	C13-S19-N22	2.32	109.76	106.06
2	A	1000	4EB	C38-C40-C2	2.26	119.98	122.13
2	A	1000	4EB	C36-C34-C33	2.15	119.98	122.80

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



6.7 Other polymers [i](#)

There are no such molecules in this entry.

6.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

7 Chemical shift validation

No chemical shift data were provided