Full wwPDB NMR Structure Validation Report (i)

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PDB ID	:	1BXL / pdb_00001bxl
Title	:	STRUCTURE OF BCL-XL/BAK PEPTIDE COMPLEX, NMR, MINIMIZED AVERAGE STRUCTURE
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Deposited on	:	1996-10-16

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 (i) 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 (i)) were used in the production of this report:

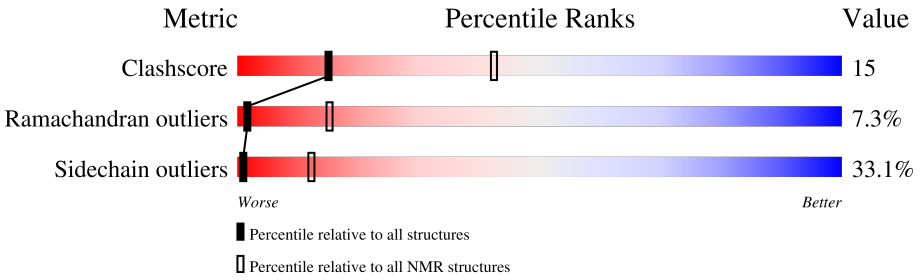
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	221	36% 32% 13% • 18%
2	B	16	50% 38% 12%

2 Ensemble composition and analysis (i)

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 3079 atoms, of which 1491 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called BCL-XL.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	181	2833	918	1366	258	285	6	0

- Molecule 2 is a protein called BAK PEPTIDE.

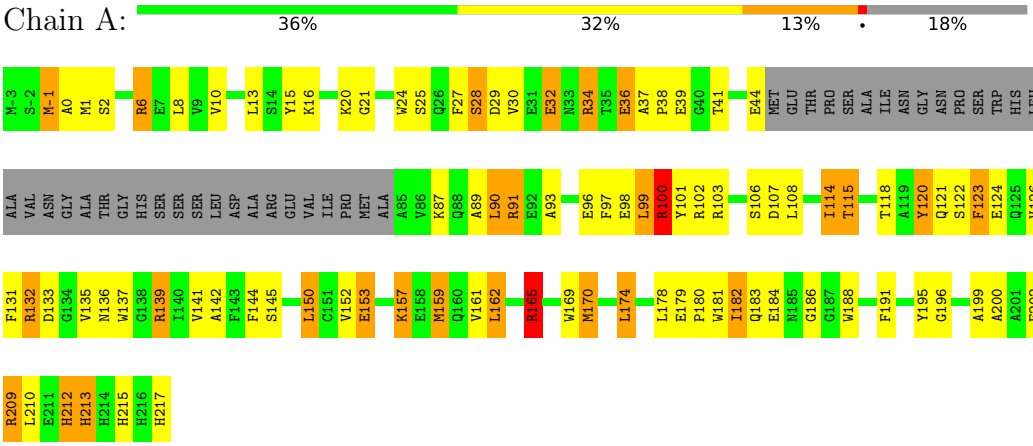
Mol	Chain	Residues	Atoms					Trace
			Total	C	H	N	O	
2	B	16	246	72	125	25	24	0

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: BCL-XL

Chain A:



• Molecule 2: BAK PEPTIDE

Chain B:

5 Refinement protocol and experimental data overview

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	

No chemical shift data was provided.

6 Model quality

6.1 Standard geometry

There are no covalent bond-length or bond-angle outliers.

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	Planarity
1	A	0	11
2	B	0	2
All	All	0	13

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

All planar outliers are listed below.

Mol	Chain	Res	Type	Group
1	A	6	ARG	Sidechain
1	A	34	ARG	Sidechain
1	A	91	ARG	Sidechain
1	A	100	ARG	Sidechain
1	A	102	ARG	Sidechain
1	A	103	ARG	Sidechain
1	A	132	ARG	Sidechain
1	A	139	ARG	Sidechain
1	A	165	ARG	Sidechain
1	A	204	ARG	Sidechain
1	A	209	ARG	Sidechain
2	B	576	ARG	Sidechain
2	B	587	ARG	Sidechain

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	1467	1366	1366	46
2	B	121	125	122	4
All	All	1588	1491	1488	46

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 15.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:131:PHE:CZ	1:A:135:VAL:HG22	0.81	2.10
1:A:8:LEU:HD12	1:A:188:TRP:CZ2	0.76	2.15
1:A:101:TYR:OH	2:B:574:VAL:HG12	0.71	1.84
1:A:93:ALA:HB1	1:A:141:VAL:HG11	0.69	1.65
1:A:142:ALA:HB1	2:B:578:LEU:HD23	0.64	1.69
1:A:90:LEU:HD12	1:A:191:PHE:CE2	0.62	2.29
1:A:114:ILE:HD12	1:A:150:LEU:HD23	0.60	1.73
1:A:126:VAL:HG22	2:B:574:VAL:HG23	0.59	1.73
1:A:114:ILE:HG22	1:A:159:MET:CE	0.58	2.29
1:A:114:ILE:CD1	1:A:150:LEU:HD23	0.58	2.28
1:A:144:PHE:CZ	1:A:174:LEU:HD11	0.57	2.35
1:A:114:ILE:O	1:A:115:THR:HG23	0.57	1.99
1:A:114:ILE:HG22	1:A:159:MET:HE3	0.57	1.76
1:A:25:SER:O	1:A:30:VAL:HG12	0.56	2.01
1:A:89:ALA:HB1	1:A:195:TYR:O	0.55	2.02
1:A:96:GLU:OE1	1:A:200:ALA:HB3	0.54	2.03
1:A:93:ALA:CB	1:A:141:VAL:HG11	0.54	2.32
1:A:157:LYS:HD2	1:A:159:MET:HE1	0.52	1.81
1:A:37:ALA:HB1	1:A:38:PRO:HD2	0.51	1.81
1:A:123:PHE:CE1	1:A:127:VAL:HG21	0.50	2.41
1:A:13:LEU:HD12	1:A:24:TRP:CH2	0.50	2.41
1:A:212:HIS:O	1:A:213:HIS:C	0.50	2.54
1:A:178:LEU:O	1:A:182:ILE:HD12	0.50	2.07
1:A:182:ILE:HG22	1:A:183:GLN:N	0.49	2.21
1:A:6:ARG:O	1:A:10:VAL:HG23	0.49	2.06
1:A:152:VAL:HG12	1:A:153:GLU:N	0.48	2.23
1:A:162:LEU:HD13	1:A:162:LEU:O	0.48	2.09
1:A:126:VAL:HG22	2:B:574:VAL:CG2	0.48	2.38
1:A:36:GLU:O	1:A:37:ALA:HB3	0.47	2.08
1:A:179:GLU:N	1:A:180:PRO:HD2	0.46	2.25
1:A:24:TRP:CE2	1:A:28:SER:CB	0.45	2.99
1:A:127:VAL:HG12	1:A:128:ASN:N	0.45	2.26
1:A:131:PHE:CE2	1:A:135:VAL:HG22	0.45	2.47
1:A:213:HIS:O	1:A:213:HIS:CD2	0.44	2.70

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:165:ARG:CG	1:A:169:TRP:CZ2	0.44	3.00
1:A:99:LEU:HD23	1:A:99:LEU:C	0.44	2.38
1:A:137:TRP:CZ2	1:A:181:TRP:CZ3	0.44	3.05
1:A:195:TYR:HA	1:A:199:ALA:HB3	0.44	1.89
1:A:99:LEU:HD23	1:A:100:ARG:N	0.43	2.28
1:A:196:GLY:N	1:A:199:ALA:HB2	0.43	2.28
1:A:135:VAL:O	1:A:181:TRP:CZ2	0.42	2.73
1:A:13:LEU:HD21	1:A:170:MET:HE2	0.42	1.92
1:A:130:LEU:N	1:A:130:LEU:CD1	0.41	2.84
1:A:179:GLU:N	1:A:180:PRO:CD	0.41	2.84
1:A:120:TYR:CD1	1:A:121:GLN:N	0.40	2.89
1:A:215:HIS:O	1:A:217:HIS:CE1	0.40	2.74

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	179/221 (81%)	139 (78%)	26 (15%)	14 (8%)	1 14
2	B	14/16 (88%)	12 (86%)	2 (14%)	0 (0%)	100 100
All	All	193/237 (81%)	151 (78%)	28 (15%)	14 (7%)	1 15

All 14 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	-1	MET
1	A	0	ALA
1	A	20	LYS
1	A	21	GLY
1	A	32	GLU
1	A	39	GLU
1	A	44	GLU
1	A	114	ILE
1	A	133	ASP
1	A	186	GLY

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Mol	Chain	Res	Type
1	A	208	GLU
1	A	209	ARG
1	A	212	HIS
1	A	213	HIS

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	154/185 (83%)	105 (68%)	49 (32%)	1 14
2	B	12/12 (100%)	6 (50%)	6 (50%)	0 1
All	All	166/197 (84%)	111 (67%)	55 (33%)	1 12

All 55 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	-1	MET
1	A	1	MET
1	A	2	SER
1	A	15	TYR
1	A	16	LYS
1	A	27	PHE
1	A	28	SER
1	A	29	ASP
1	A	32	GLU
1	A	34	ARG
1	A	36	GLU
1	A	41	THR
1	A	87	LYS
1	A	90	LEU
1	A	91	ARG
1	A	97	PHE
1	A	98	GLU
1	A	99	LEU
1	A	100	ARG
1	A	106	SER

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Mol	Chain	Res	Type
1	A	107	ASP
1	A	108	LEU
1	A	115	THR
1	A	118	THR
1	A	120	TYR
1	A	122	SER
1	A	123	PHE
1	A	124	GLU
1	A	127	VAL
1	A	129	GLU
1	A	132	ARG
1	A	136	ASN
1	A	139	ARG
1	A	145	SER
1	A	150	LEU
1	A	153	GLU
1	A	157	LYS
1	A	159	MET
1	A	161	VAL
1	A	162	LEU
1	A	165	ARG
1	A	170	MET
1	A	174	LEU
1	A	182	ILE
1	A	184	GLU
1	A	202	GLU
1	A	203	SER
1	A	204	ARG
1	A	210	LEU
2	B	573	GLN
2	B	576	ARG
2	B	578	LEU
2	B	580	ILE
2	B	581	ILE
2	B	585	ILE

6.3.3 RNA

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains (i)

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

6.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.6 Ligand geometry (i)

There are no ligands in this entry.

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