



wwPDB X-ray Structure Validation Summary Report

Mar 1, 2014 – 02:45 AM GMT

PDB ID : 1KD7
Title : Crystal structure of an extracellular domain fragment of human BAFF
Authors : Karpusas, M.; Cachero, T.G.; Qian, F.; Boriack-Sjodin, A.; Mullen, C.;
Strauch, K.; Hsu, Y-M.; Kalled, S.L.
Deposited on : 2001-11-12
Resolution : 2.80 Å(reported)

This is a wwPDB validation summary report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

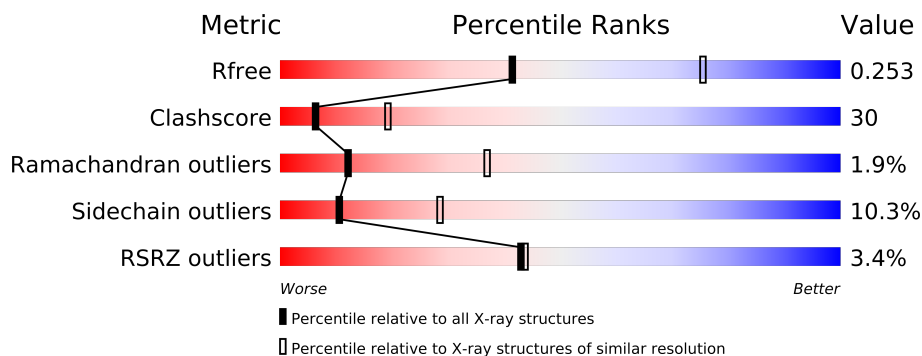
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

1 Overall quality at a glance

The reported resolution of this entry is 2.80 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}	66092	1799 (2.80-2.80)
Clashscore	79885	2295 (2.80-2.80)
Ramachandran outliers	78287	2252 (2.80-2.80)
Sidechain outliers	78261	2254 (2.80-2.80)
RSRZ outliers	66119	1802 (2.80-2.80)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	164	
1	B	164	
1	C	164	
1	K	164	
1	L	164	
1	M	164	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6858 atoms, of which 0 are hydrogen and 0 are deuterium.

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 TUMOR NECROSIS FACTOR LIGAND SUPERFAMILY MEMBER 13B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			
1	B	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			
1	C	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			
1	K	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			
1	L	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			
1	M	144	Total	C	N	O	S	0	0	0
			1143	736	184	218	5			

There are 78 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	123	GLN	-	SEE REMARK 999	UNP Q9Y275
A	124	LYS	-	SEE REMARK 999	UNP Q9Y275
A	125	LEU	-	SEE REMARK 999	UNP Q9Y275
A	126	ILE	-	SEE REMARK 999	UNP Q9Y275
A	127	SER	-	SEE REMARK 999	UNP Q9Y275
A	128	GLU	-	SEE REMARK 999	UNP Q9Y275
A	129	GLU	-	SEE REMARK 999	UNP Q9Y275
A	130	ASP	-	SEE REMARK 999	UNP Q9Y275
A	131	LEU	-	SEE REMARK 999	UNP Q9Y275
A	132	ASN	-	SEE REMARK 999	UNP Q9Y275
A	133	LYS	-	SEE REMARK 999	UNP Q9Y275
A	134	GLU	-	SEE REMARK 999	UNP Q9Y275
A	135	LEU	-	SEE REMARK 999	UNP Q9Y275
B	123	GLN	-	SEE REMARK 999	UNP Q9Y275
B	124	LYS	-	SEE REMARK 999	UNP Q9Y275
B	125	LEU	-	SEE REMARK 999	UNP Q9Y275

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Chain	Residue	Modelled	Actual	Comment	Reference
B	126	ILE	-	SEE REMARK 999	UNP Q9Y275
B	127	SER	-	SEE REMARK 999	UNP Q9Y275
B	128	GLU	-	SEE REMARK 999	UNP Q9Y275
B	129	GLU	-	SEE REMARK 999	UNP Q9Y275
B	130	ASP	-	SEE REMARK 999	UNP Q9Y275
B	131	LEU	-	SEE REMARK 999	UNP Q9Y275
B	132	ASN	-	SEE REMARK 999	UNP Q9Y275
B	133	LYS	-	SEE REMARK 999	UNP Q9Y275
B	134	GLU	-	SEE REMARK 999	UNP Q9Y275
B	135	LEU	-	SEE REMARK 999	UNP Q9Y275
C	123	GLN	-	SEE REMARK 999	UNP Q9Y275
C	124	LYS	-	SEE REMARK 999	UNP Q9Y275
C	125	LEU	-	SEE REMARK 999	UNP Q9Y275
C	126	ILE	-	SEE REMARK 999	UNP Q9Y275
C	127	SER	-	SEE REMARK 999	UNP Q9Y275
C	128	GLU	-	SEE REMARK 999	UNP Q9Y275
C	129	GLU	-	SEE REMARK 999	UNP Q9Y275
C	130	ASP	-	SEE REMARK 999	UNP Q9Y275
C	131	LEU	-	SEE REMARK 999	UNP Q9Y275
C	132	ASN	-	SEE REMARK 999	UNP Q9Y275
C	133	LYS	-	SEE REMARK 999	UNP Q9Y275
C	134	GLU	-	SEE REMARK 999	UNP Q9Y275
C	135	LEU	-	SEE REMARK 999	UNP Q9Y275
K	123	GLN	-	SEE REMARK 999	UNP Q9Y275
K	124	LYS	-	SEE REMARK 999	UNP Q9Y275
K	125	LEU	-	SEE REMARK 999	UNP Q9Y275
K	126	ILE	-	SEE REMARK 999	UNP Q9Y275
K	127	SER	-	SEE REMARK 999	UNP Q9Y275
K	128	GLU	-	SEE REMARK 999	UNP Q9Y275
K	129	GLU	-	SEE REMARK 999	UNP Q9Y275
K	130	ASP	-	SEE REMARK 999	UNP Q9Y275
K	131	LEU	-	SEE REMARK 999	UNP Q9Y275
K	132	ASN	-	SEE REMARK 999	UNP Q9Y275
K	133	LYS	-	SEE REMARK 999	UNP Q9Y275
K	134	GLU	-	SEE REMARK 999	UNP Q9Y275
K	135	LEU	-	SEE REMARK 999	UNP Q9Y275
L	123	GLN	-	SEE REMARK 999	UNP Q9Y275
L	124	LYS	-	SEE REMARK 999	UNP Q9Y275
L	125	LEU	-	SEE REMARK 999	UNP Q9Y275
L	126	ILE	-	SEE REMARK 999	UNP Q9Y275
L	127	SER	-	SEE REMARK 999	UNP Q9Y275
L	128	GLU	-	SEE REMARK 999	UNP Q9Y275

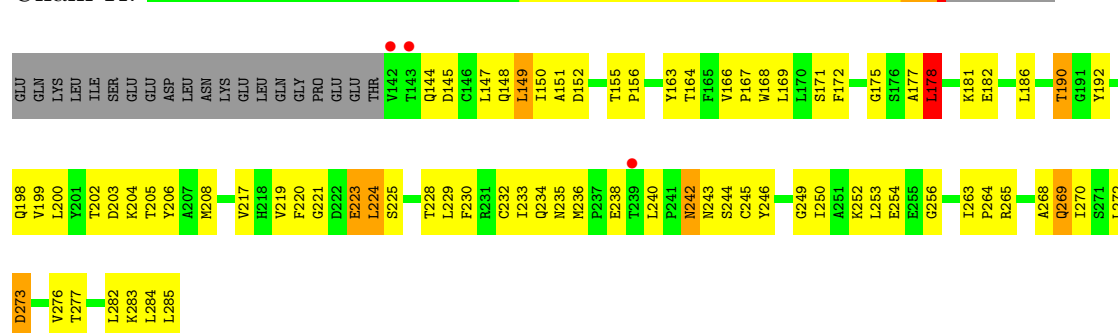
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Chain	Residue	Modelled	Actual	Comment	Reference
L	129	GLU	-	SEE REMARK 999	UNP Q9Y275
L	130	ASP	-	SEE REMARK 999	UNP Q9Y275
L	131	LEU	-	SEE REMARK 999	UNP Q9Y275
L	132	ASN	-	SEE REMARK 999	UNP Q9Y275
L	133	LYS	-	SEE REMARK 999	UNP Q9Y275
L	134	GLU	-	SEE REMARK 999	UNP Q9Y275
L	135	LEU	-	SEE REMARK 999	UNP Q9Y275
M	123	GLN	-	SEE REMARK 999	UNP Q9Y275
M	124	LYS	-	SEE REMARK 999	UNP Q9Y275
M	125	LEU	-	SEE REMARK 999	UNP Q9Y275
M	126	ILE	-	SEE REMARK 999	UNP Q9Y275
M	127	SER	-	SEE REMARK 999	UNP Q9Y275
M	128	GLU	-	SEE REMARK 999	UNP Q9Y275
M	129	GLU	-	SEE REMARK 999	UNP Q9Y275
M	130	ASP	-	SEE REMARK 999	UNP Q9Y275
M	131	LEU	-	SEE REMARK 999	UNP Q9Y275
M	132	ASN	-	SEE REMARK 999	UNP Q9Y275
M	133	LYS	-	SEE REMARK 999	UNP Q9Y275
M	134	GLU	-	SEE REMARK 999	UNP Q9Y275
M	135	LEU	-	SEE REMARK 999	UNP Q9Y275

● Molecule 1: TUMOR NECROSIS FACTOR LIGAND SUPERFAMILY MEMBER 13B

Chain K:



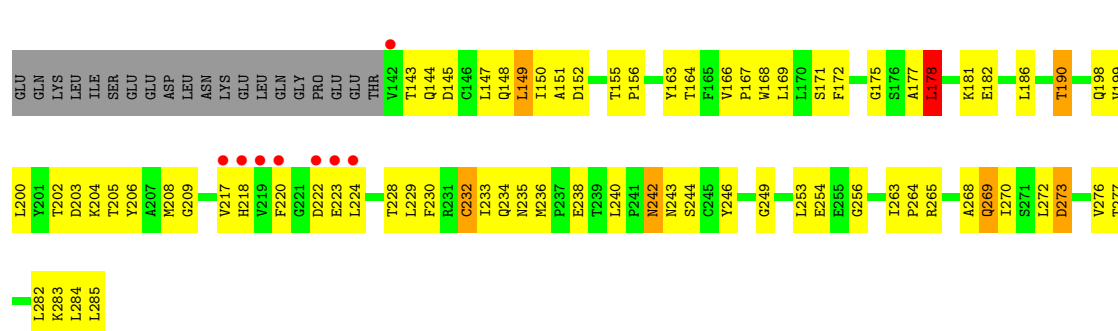
● Molecule 1: TUMOR NECROSIS FACTOR LIGAND SUPERFAMILY MEMBER 13B

Chain L:



● Molecule 1: TUMOR NECROSIS FACTOR LIGAND SUPERFAMILY MEMBER 13B

Chain M:



4 Data and refinement statistics

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α , β , γ	121.72Å 121.72Å 160.74Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 2.80 26.45 – 2.90	Depositor EDS
% Data completeness (in resolution range)	(Not available) (30.00-2.80) 97.3 (26.45-2.90)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.72 (at 2.89Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.217 , 0.250 0.221 , 0.253	Depositor DCC
R_{free} test set	2876 reflections (9.90%)	DCC
Wilson B-factor (Å ²)	44.5	Xtriage
Anisotropy	0.116	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 19.3	EDS
Estimated twinning fraction	0.036 for h,-h-k,-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 29043 reflections	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	6858	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.48% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

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	0.42	0/1165	0.67	0/1574
1	B	0.43	0/1165	0.66	0/1574
1	C	0.41	0/1165	0.66	0/1574
1	K	0.42	0/1165	0.67	0/1574
1	L	0.41	0/1165	0.67	0/1574
1	M	0.43	0/1165	0.67	0/1574
All	All	0.42	0/6990	0.67	0/9444

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1143	0	1145	77	0
1	B	1143	0	1145	78	0
1	C	1143	0	1145	90	0
1	K	1143	0	1145	83	0
1	L	1143	0	1145	80	0
1	M	1143	0	1145	86	0
All	All	6858	0	6870	414	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 30.

The worst 5 of 414 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:164:THR:HG21	1:A:268:ALA:HB2	1.40	1.04
1:K:164:THR:HG21	1:K:268:ALA:HB2	1.42	1.02
1:L:242:ASN:H	1:M:235:ASN:HD21	1.09	1.01
1:L:243:ASN:HD21	1:M:235:ASN:H	1.05	1.01
1:B:164:THR:HG21	1:B:268:ALA:HB2	1.43	1.00

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone ⓘ

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	142/164 (87%)	125 (88%)	15 (11%)	2 (1%)	16	49
1	B	142/164 (87%)	127 (89%)	13 (9%)	2 (1%)	16	49
1	C	142/164 (87%)	125 (88%)	14 (10%)	3 (2%)	11	33
1	K	142/164 (87%)	124 (87%)	14 (10%)	4 (3%)	8	24
1	L	142/164 (87%)	127 (89%)	13 (9%)	2 (1%)	16	49
1	M	142/164 (87%)	126 (89%)	13 (9%)	3 (2%)	11	33
All	All	852/984 (87%)	754 (88%)	82 (10%)	16 (2%)	12	37

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	269	GLN
1	B	269	GLN
1	C	220	PHE
1	C	269	GLN
1	K	269	GLN

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	A	126/145 (87%)	113 (90%)	13 (10%)	10	28
1	B	126/145 (87%)	113 (90%)	13 (10%)	10	28
1	C	126/145 (87%)	112 (89%)	14 (11%)	9	25
1	K	126/145 (87%)	113 (90%)	13 (10%)	10	28
1	L	126/145 (87%)	114 (90%)	12 (10%)	12	33
1	M	126/145 (87%)	113 (90%)	13 (10%)	10	28
All	All	756/870 (87%)	678 (90%)	78 (10%)	10	28

5 of 78 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	229	LEU
1	K	190	THR
1	M	228	THR
1	C	232	CYS
1	C	273	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	243	ASN
1	K	235	ASN
1	M	242	ASN
1	K	144	GLN
1	K	242	ASN

5.3.3 RNA ⓘ

There are no RNA chains 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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

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 ⓘ

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	A	144/164 (87%)	-0.02	6 (4%) 35 35	12, 34, 74, 113	0
1	B	144/164 (87%)	-0.11	3 (2%) 60 61	14, 36, 67, 101	0
1	C	144/164 (87%)	-0.13	6 (4%) 35 35	14, 38, 85, 157	0
1	K	144/164 (87%)	-0.19	3 (2%) 60 61	13, 36, 68, 104	0
1	L	144/164 (87%)	-0.12	3 (2%) 60 61	12, 37, 75, 133	0
1	M	144/164 (87%)	-0.05	8 (5%) 24 23	8, 34, 77, 112	0
All	All	864/984 (87%)	-0.10	29 (3%) 43 44	8, 36, 77, 157	0

The worst 5 of 29 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	222	ASP	4.9
1	L	161	GLY	4.6
1	C	218	HIS	4.5
1	M	220	PHE	4.2
1	M	142	VAL	4.2

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.