wwPDB X-ray Structure Validation Summary Report (i)

Mar 24, 2024 – 12:15 AM EDT

PDB ID	:	1FGN
Title	:	MONOCLONAL MURINE ANTIBODY 5G9-ANTI-HUMAN TISSUE FACTOR
Authors	:	Huang, M.; Syed, R.; Stura, E.A.; Stone, M.J.; Stefanko, R.S.; Ruf, W.; Edgington, T.S.; Wilson, I.A.
Deposited on	:	1997-04-10
Resolution	:	2.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 (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:

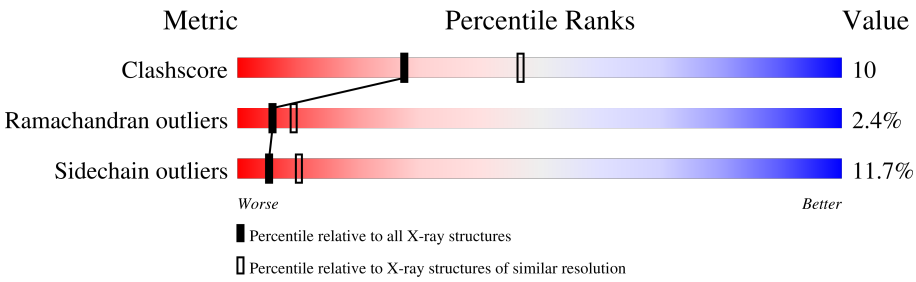
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)

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 <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	L	214	68% 27% 5%
2	H	214	71% 23% 5% •

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 3304 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 IMMUNOGLOBULIN FAB 5G9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	L	214	1672	1040	278	346	8	0	0	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	30	ARG	TYR	conflict	GB 1613779
L	31	LYS	SER	conflict	GB 1613779
L	34	ASN	SER	conflict	GB 1613779
L	36	TYR	PHE	conflict	GB 1613779
L	41	TRP	GLY	conflict	GB 1613779
L	50	TYR	ARG	conflict	GB 1613779
L	52	THR	ASN	conflict	GB 1613779
L	53	SER	ARG	conflict	GB 1613779
L	55	ALA	VAL	conflict	GB 1613779
L	80	SER	TYR	conflict	GB 1613779
L	81	ASP	GLU	conflict	GB 1613779
L	83	THR	LEU	conflict	GB 1613779
L	84	ALA	GLY	conflict	GB 1613779
L	85	THR	ILE	conflict	GB 1613779
L	91	HIS	PHE	conflict	GB 1613779
L	92	GLY	ASP	conflict	GB 1613779
L	94	SER	PHE	conflict	GB 1613779
L	107	ASN	LYS	conflict	GB 1613779

- Molecule 2 is a protein called IMMUNOGLOBULIN FAB 5G9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	214	1632	1034	263	329	6	0	0	0

There are 25 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	3	GLN	LYS	conflict	PIR S49220
H	5	GLN	LEU	conflict	PIR S49220
H	6	GLN	GLU	conflict	PIR S49220
H	13	ARG	LYS	conflict	PIR S49220
H	14	PRO	SER	conflict	PIR S49220
H	17	LEU	SER	conflict	PIR S49220
H	23	LYS	THR	conflict	PIR S49220
H	32	TYR	THR	conflict	PIR S49220
H	50	LEU	ARG	conflict	PIR S49220
H	54	GLU	ALA	conflict	PIR S49220
H	57	ASN	GLU	conflict	PIR S49220
H	58	THR	ILE	conflict	PIR S49220
H	59	ILE	LYS	conflict	PIR S49220
H	67	LYS	THR	conflict	PIR S49220
H	69	SER	THR	conflict	PIR S49220
H	76	SER	THR	conflict	PIR S49220
H	97	ALA	VAL	conflict	PIR S49220
H	?	-	ARG	deletion	PIR S49220
H	?	-	GLY	deletion	PIR S49220
H	99	ASP	TYR	conflict	PIR S49220
H	100	ASN	GLY	conflict	PIR S49220
H	102	TYR	SER	conflict	PIR S49220
H	103	TYR	GLN	conflict	PIR S49220
H	104	PHE	GLU	conflict	PIR S49220
H	105	ASP	PRO	conflict	PIR S49220

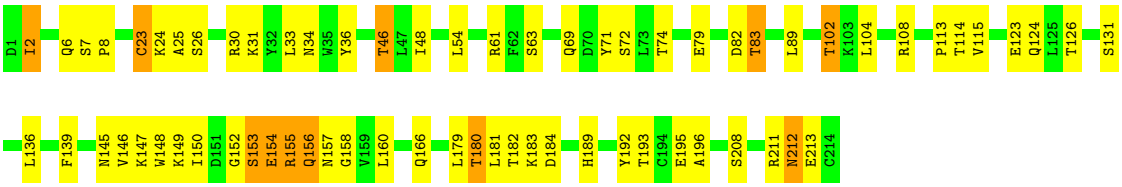
3 Residue-property plots (i)

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.

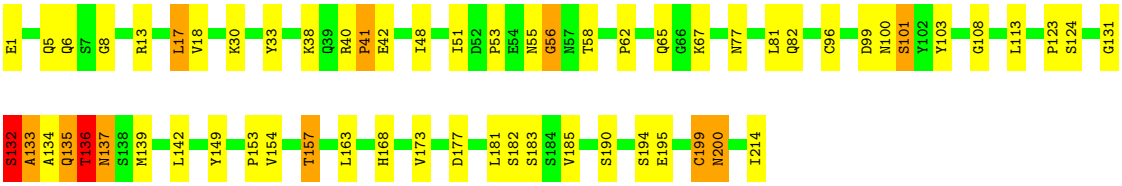
• Molecule 1: IMMUNOGLOBULIN FAB 5G9

Chain L: 68% 27% 5%



• Molecule 2: IMMUNOGLOBULIN FAB 5G9

Chain H: 71% 23% 5%



4 Data and refinement statistics (i)

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	91.60Å 93.70Å 60.70Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.50	Depositor
% Data completeness (in resolution range)	92.4 (8.00-2.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.217 , 0.304	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3304	wwPDB-VP
Average B, all atoms (Å^2)	10.0	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	L	0.66	0/1711	0.88	2/2321 (0.1%)
2	H	0.68	2/1675 (0.1%)	0.93	7/2292 (0.3%)
All	All	0.67	2/3386 (0.1%)	0.90	9/4613 (0.2%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	199	CYS	CB-SG	-5.81	1.72	1.81
2	H	96	CYS	CB-SG	-5.40	1.73	1.81

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	56	GLY	N-CA-C	8.70	134.85	113.10
2	H	131	GLY	N-CA-C	-8.56	91.70	113.10
2	H	136	THR	N-CA-C	-6.86	92.47	111.00
2	H	17	LEU	CA-CB-CG	6.06	129.23	115.30
2	H	133	ALA	N-CA-C	5.53	125.92	111.00

There are no chirality outliers.

There are no planarity outliers.

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	L	1672	0	1590	40	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	H	1632	0	1582	26	0
All	All	3304	0	3172	64	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 10.

The worst 5 of 64 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)
2:H:137:ASN:ND2	2:H:139:MET:HG3	1.95	0.81
1:L:2:ILE:HD11	1:L:25:ALA:HB1	1.65	0.77
2:H:6:GLN:HE21	2:H:108:GLY:HA3	1.50	0.76
1:L:6:GLN:HE21	1:L:102:THR:HG23	1.51	0.75
1:L:149:LYS:HD3	1:L:153:SER:HA	1.75	0.69

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	L	212/214 (99%)	202 (95%)	8 (4%)	2 (1%)	17 31
2	H	212/214 (99%)	191 (90%)	13 (6%)	8 (4%)	3 4
All	All	424/428 (99%)	393 (93%)	21 (5%)	10 (2%)	6 9

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	212	ASN
2	H	41	PRO
2	H	56	GLY

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Mol	Chain	Res	Type
2	H	133	ALA
2	H	137	ASN

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	L	191/191 (100%)	168 (88%)	23 (12%)	5 9
2	H	185/185 (100%)	164 (89%)	21 (11%)	5 11
All	All	376/376 (100%)	332 (88%)	44 (12%)	5 10

5 of 44 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	H	42	GLU
2	H	153	PRO
2	H	77	ASN
2	H	132	SER
2	H	177	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 9 such sidechains are listed below:

Mol	Chain	Res	Type
2	H	6	GLN
2	H	77	ASN
1	L	156	GLN
1	L	189	HIS
2	H	3	GLN

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 monosaccharides 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 (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.