



Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 07:15 am BST

PDB ID : 1JHL
Title : THREE-DIMENSIONAL STRUCTURE OF A HETEROCLITIC ANTIGEN-ANTIBODY CROSS-REACTION COMPLEX
Authors : Chitarra, V.; Alzari, P.M.; Bentley, G.A.; Bhat, T.N.; Eisele, J.-L.; Poljak, R.J.
Deposited on : 1993-05-04
Resolution : 2.40 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtrriage (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) : 2.11

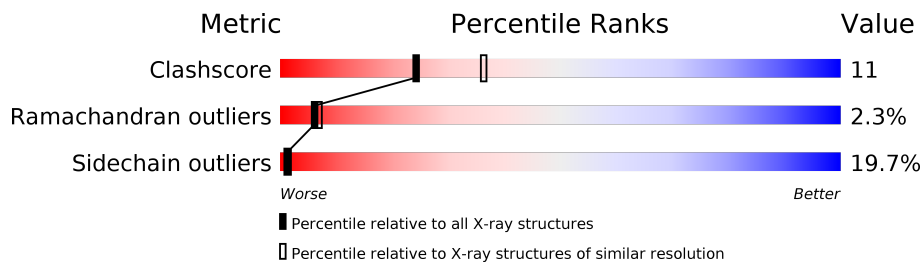
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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))
Clashescore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)

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 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	L	108	
2	H	116	
3	A	129	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 2745 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 IGG1-KAPPA D11.15 FV (LIGHT CHAIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	L	108	833	525	136	169	3	0	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	2	ILE	VAL	CONFLICT	GB 196740
L	3	GLU	GLN	CONFLICT	GB 196740
L	4	LEU	ILE	CONFLICT	GB 196740
L	12	VAL	PRO	CONFLICT	GB 196740
L	14	SER	ALA	CONFLICT	GB 196740
L	32	SER	TYR	CONFLICT	GB 196740
L	45	ASN	LYS	CONFLICT	GB 196740
L	65	SER	ASN	CONFLICT	GB 196740
L	87	ILE	TYR	CONFLICT	GB 196740

- Molecule 2 is a protein called IGG1-KAPPA D11.15 FV (HEAVY CHAIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	116	916	577	150	185	4	0	0	0

- Molecule 3 is a protein called PHEASANT EGG WHITE LYSOZYME.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	A	129	996	614	187	184	11	0	0	0

There is a discrepancy between the modelled and reference sequences:

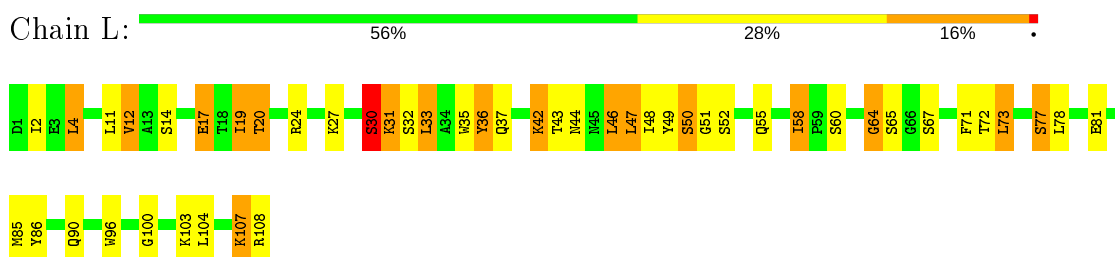
Chain	Residue	Modelled	Actual	Comment	Reference
A	103	ASP	ASN	CONFLICT	UNP P00702

3 Residue-property plots [i](#)

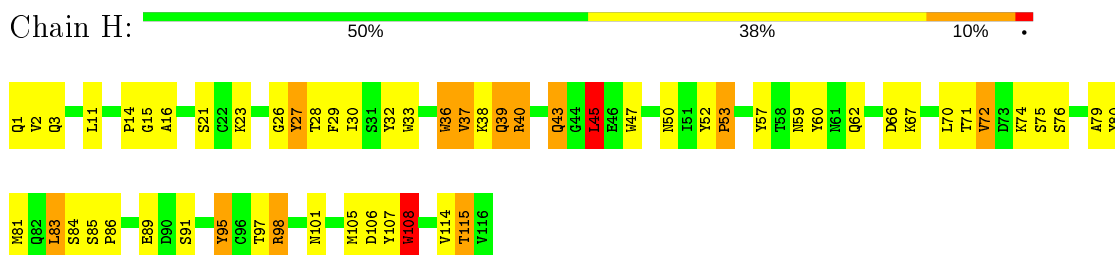
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according 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.

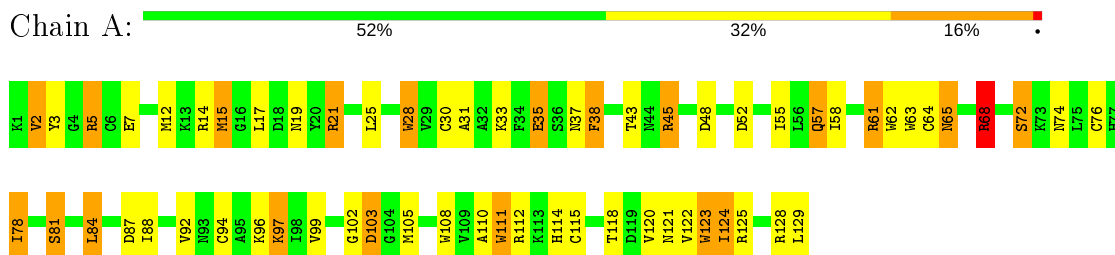
- Molecule 1: IGG1-KAPPA D11.15 FV (LIGHT CHAIN)



- Molecule 2: IGG1-KAPPA D11.15 FV (HEAVY CHAIN)



- Molecule 3: PHEASANT EGG WHITE LYSOZYME



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α , β , γ	57.80Å 57.80Å 282.10Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	7.00 – 2.40	Depositor
% Data completeness (in resolution range)	(Not available) (7.00-2.40)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, R_{free}	0.214 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	2745	wwPDB-VP
Average B, all atoms (Å ²)	19.0	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	1.07	0/852	1.92	23/1153 (2.0%)
2	H	1.13	0/939	2.15	39/1276 (3.1%)
3	A	1.16	0/1017	2.27	57/1373 (4.2%)
All	All	1.12	0/2808	2.13	119/3802 (3.1%)

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
3	A	0	1

There are no bond length outliers.

All (119) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	57	TYR	CB-CG-CD1	-11.14	114.31	121.00
2	H	36	TRP	CD1-CG-CD2	10.80	114.94	106.30
3	A	123	TRP	CD1-CG-CD2	10.57	114.76	106.30
3	A	28	TRP	CD1-CG-CD2	10.45	114.66	106.30
3	A	63	TRP	CD1-CG-CD2	10.32	114.56	106.30
3	A	108	TRP	CD1-CG-CD2	9.81	114.15	106.30
1	L	36	TYR	CB-CG-CD1	-9.62	115.23	121.00
3	A	123	TRP	CE2-CD2-CG	-9.53	99.68	107.30
3	A	63	TRP	CE2-CD2-CG	-9.03	100.08	107.30
2	H	27	TYR	CB-CG-CD2	-8.93	115.64	121.00
3	A	112	ARG	NE-CZ-NH1	8.86	124.73	120.30
3	A	14	ARG	NE-CZ-NH2	-8.84	115.88	120.30
2	H	36	TRP	CG-CD1-NE1	-8.71	101.39	110.10
2	H	108	TRP	CD1-CG-CD2	8.61	113.19	106.30
3	A	21	ARG	NE-CZ-NH1	8.56	124.58	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	62	TRP	CE2-CD2-CG	-8.47	100.52	107.30
3	A	62	TRP	CD1-CG-CD2	8.45	113.06	106.30
3	A	108	TRP	CE2-CD2-CG	-8.18	100.76	107.30
3	A	111	TRP	CD1-CG-CD2	8.14	112.81	106.30
2	H	47	TRP	CD1-CG-CD2	7.92	112.64	106.30
2	H	36	TRP	CE2-CD2-CG	-7.85	101.02	107.30
2	H	108	TRP	CE2-CD2-CG	-7.73	101.12	107.30
2	H	33	TRP	CD1-CG-CD2	7.68	112.44	106.30
3	A	84	LEU	CA-CB-CG	7.52	132.60	115.30
3	A	63	TRP	CG-CD1-NE1	-7.47	102.62	110.10
2	H	107	TYR	CB-CG-CD2	-7.46	116.52	121.00
3	A	111	TRP	CE2-CD2-CG	-7.36	101.42	107.30
2	H	98	ARG	NE-CZ-NH1	7.35	123.97	120.30
3	A	28	TRP	CE2-CD2-CG	-7.28	101.47	107.30
3	A	28	TRP	CD2-CE2-CZ2	-7.21	113.64	122.30
3	A	63	TRP	CG-CD2-CE3	7.18	140.37	133.90
1	L	96	TRP	CE2-CD2-CG	-7.18	101.56	107.30
3	A	62	TRP	CB-CG-CD1	-7.14	117.71	127.00
2	H	47	TRP	CG-CD1-NE1	-7.10	103.00	110.10
3	A	68	ARG	NE-CZ-NH2	-7.08	116.76	120.30
2	H	37	VAL	CG1-CB-CG2	-6.95	99.78	110.90
3	A	62	TRP	CG-CD2-CE3	6.92	140.13	133.90
2	H	33	TRP	CE2-CD2-CG	-6.87	101.80	107.30
3	A	65	ASN	CA-C-N	-6.87	102.09	117.20
1	L	77	SER	CA-C-N	-6.76	102.33	117.20
1	L	96	TRP	CD1-CG-CD2	6.75	111.70	106.30
1	L	35	TRP	CE2-CD2-CG	-6.74	101.91	107.30
2	H	36	TRP	CD1-NE1-CE2	6.63	114.97	109.00
3	A	68	ARG	NE-CZ-NH1	6.62	123.61	120.30
2	H	47	TRP	CE2-CD2-CG	-6.58	102.04	107.30
1	L	67	SER	N-CA-CB	-6.54	100.70	110.50
2	H	47	TRP	CD1-NE1-CE2	6.43	114.79	109.00
2	H	57	TYR	CD1-CG-CD2	6.40	124.94	117.90
3	A	105	MET	CA-CB-CG	-6.38	102.45	113.30
3	A	125	ARG	NE-CZ-NH2	-6.37	117.12	120.30
3	A	5	ARG	NE-CZ-NH2	-6.36	117.12	120.30
3	A	63	TRP	CB-CG-CD1	-6.33	118.77	127.00
1	L	96	TRP	CG-CD2-CE3	6.27	139.55	133.90
2	H	45	LEU	CA-CB-CG	6.15	129.45	115.30
3	A	38	PHE	CB-CG-CD2	-6.14	116.50	120.80
1	L	4	LEU	CA-CB-CG	6.13	129.39	115.30
3	A	112	ARG	NE-CZ-NH2	-6.08	117.26	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	35	GLU	CA-C-N	6.06	130.53	117.20
3	A	28	TRP	CG-CD1-NE1	-6.04	104.06	110.10
3	A	123	TRP	CG-CD1-NE1	-6.02	104.08	110.10
1	L	30	SER	N-CA-C	5.99	127.16	111.00
3	A	108	TRP	CB-CG-CD1	-5.95	119.27	127.00
3	A	108	TRP	CG-CD2-CE3	5.94	139.25	133.90
3	A	87	ASP	N-CA-CB	-5.93	99.92	110.60
1	L	100	GLY	CA-C-N	5.93	128.06	116.20
2	H	52	TYR	CB-CG-CD1	-5.92	117.45	121.00
1	L	35	TRP	CD1-CG-CD2	5.91	111.03	106.30
3	A	124	ILE	CA-CB-CG1	5.91	122.23	111.00
1	L	42	LYS	CA-CB-CG	5.88	126.35	113.40
1	L	46	LEU	CA-CB-CG	5.83	128.71	115.30
3	A	112	ARG	CA-CB-CG	5.82	126.21	113.40
3	A	28	TRP	CE2-CD2-CE3	5.81	125.68	118.70
2	H	74	LYS	CB-CG-CD	-5.77	96.60	111.60
3	A	2	VAL	O-C-N	5.75	131.90	122.70
2	H	27	TYR	CB-CG-CD1	5.72	124.43	121.00
2	H	80	TYR	CG-CD1-CE1	-5.71	116.74	121.30
2	H	97	THR	OG1-CB-CG2	-5.69	96.92	110.00
3	A	28	TRP	NE1-CE2-CZ2	5.68	136.65	130.40
1	L	19	ILE	N-CA-CB	-5.67	97.75	110.80
3	A	12	MET	CG-SD-CE	-5.67	91.13	100.20
2	H	32	TYR	CB-CG-CD2	-5.66	117.60	121.00
2	H	108	TRP	CB-CG-CD1	-5.65	119.65	127.00
3	A	5	ARG	CB-CG-CD	-5.63	96.96	111.60
1	L	64	GLY	CA-C-N	-5.63	104.81	117.20
1	L	30	SER	N-CA-CB	-5.59	102.11	110.50
2	H	95	TYR	CG-CD2-CE2	-5.51	116.89	121.30
3	A	108	TRP	CG-CD1-NE1	-5.50	104.60	110.10
2	H	33	TRP	CG-CD1-NE1	-5.49	104.61	110.10
1	L	58	ILE	CA-CB-CG1	-5.43	100.68	111.00
3	A	123	TRP	CB-CG-CD1	-5.43	119.94	127.00
1	L	12	VAL	CG1-CB-CG2	-5.42	102.23	110.90
3	A	123	TRP	CG-CD2-CE3	5.42	138.77	133.90
2	H	14	PRO	CA-C-N	-5.41	105.37	116.20
2	H	106	ASP	CB-CG-OD1	5.39	123.15	118.30
3	A	111	TRP	CG-CD1-NE1	-5.37	104.73	110.10
1	L	33	LEU	CA-CB-CG	5.35	127.61	115.30
3	A	7	GLU	CA-CB-CG	5.34	125.16	113.40
2	H	15	GLY	CA-C-N	5.34	128.95	117.20
2	H	98	ARG	NE-CZ-NH2	-5.33	117.63	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	112	ARG	CB-CG-CD	-5.33	97.74	111.60
3	A	43	THR	O-C-N	-5.32	114.18	122.70
1	L	17	GLU	CA-CB-CG	5.30	125.06	113.40
2	H	57	TYR	CG-CD2-CE2	-5.28	117.08	121.30
3	A	68	ARG	N-CA-CB	-5.27	101.11	110.60
2	H	83	LEU	CA-C-N	-5.27	105.61	117.20
1	L	49	TYR	CB-CG-CD1	-5.24	117.86	121.00
1	L	103	LYS	N-CA-C	-5.19	96.99	111.00
1	L	73	LEU	CB-CG-CD2	-5.18	102.19	111.00
3	A	62	TRP	CG-CD1-NE1	-5.16	104.94	110.10
2	H	26	GLY	CA-C-N	5.16	128.54	117.20
3	A	28	TRP	CB-CG-CD2	-5.15	119.90	126.60
2	H	47	TRP	CH2-CZ2-CE2	5.11	122.50	117.40
3	A	120	VAL	CG1-CB-CG2	5.10	119.06	110.90
3	A	31	ALA	N-CA-CB	5.07	117.19	110.10
3	A	45	ARG	NE-CZ-NH1	5.05	122.82	120.30
2	H	95	TYR	CD1-CG-CD2	5.05	123.45	117.90
2	H	53	PRO	CA-C-N	5.04	128.28	117.20
3	A	124	ILE	CA-CB-CG2	-5.04	100.82	110.90
2	H	76	SER	CA-C-N	5.04	128.28	117.20

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	A	65	ASN	Mainchain

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	833	0	811	15	0
2	H	916	0	866	19	0
3	A	996	0	958	25	0
All	All	2745	0	2635	59	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 (59) 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)
3:A:17:LEU:HD22	3:A:92:VAL:HG13	1.65	0.78
3:A:76:CYS:HB2	3:A:78:ILE:HD12	1.67	0.74
2:H:67:LYS:O	2:H:83:LEU:HD23	1.89	0.72
2:H:30:ILE:HA	2:H:53:PRO:HB2	1.73	0.70
2:H:40:ARG:HH12	2:H:89:GLU:HB2	1.59	0.67
3:A:61:ARG:O	3:A:72:SER:HA	1.96	0.65
3:A:110:ALA:O	3:A:114:HIS:HB2	1.96	0.64
1:L:14:SER:O	1:L:17:GLU:HG2	1.99	0.61
3:A:64:CYS:HB3	3:A:78:ILE:HD11	1.82	0.61
3:A:64:CYS:HB3	3:A:78:ILE:CD1	2.31	0.61
3:A:55:ILE:HG21	3:A:88:ILE:HG22	1.83	0.60
3:A:92:VAL:O	3:A:96:LYS:HG3	2.03	0.59
1:L:12:VAL:HG12	1:L:107:LYS:HB2	1.85	0.58
3:A:76:CYS:HB2	3:A:78:ILE:CD1	2.37	0.55
3:A:58:ILE:HD13	3:A:94:CYS:SG	2.47	0.55
3:A:45:ARG:HD3	3:A:68:ARG:NH2	2.23	0.54
3:A:17:LEU:HD13	3:A:96:LYS:HE2	1.91	0.53
2:H:91:SER:HA	2:H:114:VAL:O	2.10	0.52
2:H:29:PHE:HZ	2:H:72:VAL:CG2	2.23	0.52
1:L:36:TYR:O	1:L:86:TYR:HA	2.11	0.51
2:H:37:VAL:HB	2:H:95:TYR:HB2	1.94	0.50
3:A:15:MET:HE1	3:A:88:ILE:HG13	1.92	0.50
2:H:11:LEU:HD12	2:H:115:THR:HB	1.94	0.49
2:H:38:LYS:NZ	2:H:40:ARG:HD3	2.28	0.49
2:H:39:GLN:HB3	2:H:45:LEU:HD13	1.95	0.48
3:A:45:ARG:HD3	3:A:68:ARG:HH21	1.78	0.48
2:H:36:TRP:CE2	2:H:81:MET:HB2	2.49	0.48
1:L:17:GLU:O	1:L:78:LEU:HG	2.13	0.48
1:L:50:SER:O	1:L:52:SER:N	2.47	0.47
2:H:27:TYR:CE2	2:H:29:PHE:HA	2.50	0.47
1:L:65:SER:O	1:L:71:PHE:HA	2.16	0.46
3:A:64:CYS:HA	3:A:74:ASN:OD1	2.16	0.46
3:A:94:CYS:O	3:A:97:LYS:N	2.50	0.45
3:A:2:VAL:HA	3:A:38:PHE:O	2.17	0.45
1:L:30:SER:O	1:L:31:LYS:HB2	2.17	0.45
2:H:16:ALA:O	2:H:86:PRO:HD2	2.16	0.44
3:A:52:ASP:HB3	3:A:57:GLN:HB3	1.99	0.44
2:H:23:LYS:C	2:H:23:LYS:HD3	2.38	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:3:TYR:HB2	3:A:38:PHE:HB3	2.01	0.43
3:A:111:TRP:CD1	3:A:115:CYS:HB2	2.53	0.43
1:L:4:LEU:HA	1:L:24:ARG:O	2.18	0.43
3:A:45:ARG:HG3	3:A:45:ARG:HH11	1.84	0.43
2:H:40:ARG:NE	2:H:43:GLN:HE21	2.16	0.43
1:L:20:THR:HG23	1:L:72:THR:HG23	2.01	0.43
3:A:35:GLU:HG2	3:A:110:ALA:HB3	2.02	0.42
3:A:81:SER:HA	3:A:84:LEU:HD13	2.01	0.42
2:H:2:VAL:HG13	2:H:27:TYR:CD1	2.53	0.42
2:H:105:MET:HB2	2:H:108:TRP:CZ3	2.54	0.42
1:L:64:GLY:HA2	1:L:72:THR:O	2.19	0.42
2:H:60:TYR:CE1	2:H:70:LEU:HD13	2.55	0.42
2:H:50:ASN:OD1	2:H:59:ASN:HB2	2.19	0.41
1:L:20:THR:HA	1:L:73:LEU:O	2.20	0.41
1:L:2:ILE:HB	1:L:90:GLN:HG2	2.01	0.41
3:A:30:CYS:HB2	3:A:123:TRP:CD1	2.55	0.41
2:H:72:VAL:HG23	2:H:79:ALA:HA	2.01	0.41
1:L:37:GLN:HB2	1:L:47:LEU:HD21	2.02	0.41
1:L:14:SER:HB2	1:L:17:GLU:OE1	2.21	0.41
3:A:28:TRP:CH2	3:A:99:VAL:HG11	2.56	0.40
1:L:55:GLN:OE1	1:L:55:GLN:HA	2.21	0.40

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	106/108 (98%)	94 (89%)	8 (8%)	4 (4%)	3	2
2	H	114/116 (98%)	107 (94%)	6 (5%)	1 (1%)	17	25
3	A	127/129 (98%)	108 (85%)	16 (13%)	3 (2%)	6	6
All	All	347/353 (98%)	309 (89%)	30 (9%)	8 (2%)	6	7

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	30	SER
3	A	57	GLN
3	A	102	GLY
1	L	51	GLY
1	L	60	SER
1	L	77	SER
3	A	103	ASP
2	H	101	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	94/94 (100%)	74 (79%)	20 (21%)	1	1
2	H	100/100 (100%)	82 (82%)	18 (18%)	1	2
3	A	105/105 (100%)	84 (80%)	21 (20%)	1	1
All	All	299/299 (100%)	240 (80%)	59 (20%)	1	1

All (59) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	11	LEU
1	L	19	ILE
1	L	20	THR
1	L	27	LYS
1	L	31	LYS
1	L	32	SER
1	L	33	LEU
1	L	42	LYS
1	L	43	THR
1	L	44	ASN
1	L	46	LEU
1	L	47	LEU
1	L	48	ILE

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Mol	Chain	Res	Type
1	L	50	SER
1	L	58	ILE
1	L	81	GLU
1	L	85	MET
1	L	104	LEU
1	L	107	LYS
1	L	108	ARG
2	H	1	GLN
2	H	3	GLN
2	H	21	SER
2	H	28	THR
2	H	39	GLN
2	H	40	ARG
2	H	43	GLN
2	H	45	LEU
2	H	62	GLN
2	H	66	ASP
2	H	71	THR
2	H	72	VAL
2	H	75	SER
2	H	84	SER
2	H	85	SER
2	H	98	ARG
2	H	108	TRP
2	H	115	THR
3	A	5	ARG
3	A	15	MET
3	A	19	ASN
3	A	21	ARG
3	A	25	LEU
3	A	33	LYS
3	A	37	ASN
3	A	48	ASP
3	A	61	ARG
3	A	68	ARG
3	A	72	SER
3	A	78	ILE
3	A	81	SER
3	A	97	LYS
3	A	103	ASP
3	A	118	THR
3	A	121	ASN

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Mol	Chain	Res	Type
3	A	122	VAL
3	A	124	ILE
3	A	128	ARG
3	A	129	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	H	43	GLN
2	H	59	ASN
2	H	62	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 carbohydrates 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

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.