



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 02:04 PM UTC

PDB ID : 1B4J / pdb_00001b4j
Title : COMPARISON OF THE THREE-DIMENSIONAL STRUCTURES OF A HUMANIZED AND A CHIMERIC FAB OF AN ANTI-GAMMA-INTERFERON ANTIBODY
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Deposited on : 1998-12-22
Resolution : 2.90 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 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)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

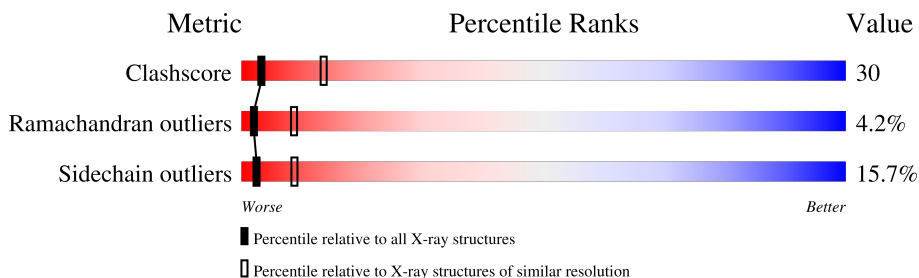
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 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	190562	2690 (2.90-2.90)
Ramachandran outliers	187476	2623 (2.90-2.90)
Sidechain outliers	187428	2625 (2.90-2.90)

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 $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	L	214	44% 47% 9%
2	H	220	40% 39% 19% .

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3313 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 ANTIBODY.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	L	214	Total	C	N	O	S	0	0	0
			1660	1038	275	340	7			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	9	LYS	SER	conflict	EMBL X95750
L	11	MET	LEU	conflict	EMBL X95750
L	12	TYR	SER	conflict	EMBL X95750
L	13	VAL	ALA	conflict	EMBL X95750
L	14	SER	PHE	conflict	EMBL X95750
L	15	ILE	VAL	conflict	EMBL X95750
L	17	GLU	ASP	conflict	EMBL X95750
L	21	LEU	ILE	conflict	EMBL X95750
L	22	SER	THR	conflict	EMBL X95750
L	24	LYS	ARG	conflict	EMBL X95750
L	27	GLU	GLN	conflict	EMBL X95750
L	28	ASN	SER	conflict	EMBL X95750
L	29	VAL	ILE	conflict	EMBL X95750
L	30	ASP	SER	conflict	EMBL X95750
L	31	THR	SER	conflict	EMBL X95750
L	33	VAL	LEU	conflict	EMBL X95750
L	34	SER	ASN	conflict	EMBL X95750
L	41	GLU	GLY	conflict	EMBL X95750
L	42	GLN	LYS	conflict	EMBL X95750
L	43	SER	ALA	conflict	EMBL X95750
L	50	GLY	ALA	conflict	EMBL X95750
L	53	ASN	SER	conflict	EMBL X95750
L	54	ARG	LEU	conflict	EMBL X95750
L	55	TYR	GLN	conflict	EMBL X95750
L	56	THR	SER	conflict	EMBL X95750
L	60	ASP	SER	conflict	EMBL X95750
L	63	THR	SER	conflict	EMBL X95750

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Chain	Residue	Modelled	Actual	Comment	Reference
L	68	ALA	GLY	conflict	EMBL X95750
L	78	VAL	LEU	conflict	EMBL X95750
L	80	ALA	PRO	conflict	EMBL X95750
L	83	LEU	PHE	conflict	EMBL X95750
L	85	ASP	THR	conflict	EMBL X95750
L	87	HIS	TYR	conflict	EMBL X95750
L	89	GLY	GLN	conflict	EMBL X95750
L	92	TYR	HIS	conflict	EMBL X95750
L	93	ASN	SER	conflict	EMBL X95750
L	94	TYR	THR	conflict	EMBL X95750
L	96	PHE	TYR	conflict	EMBL X95750
L	100	SER	GLN	conflict	EMBL X95750
L	103	LYS	ASN	conflict	EMBL X95750

- Molecule 2 is a protein called ANTIBODY.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	220	Total	C	N	O	S	0	0	0
			1653	1050	273	324	6			

3 Residue-property plots [i](#)

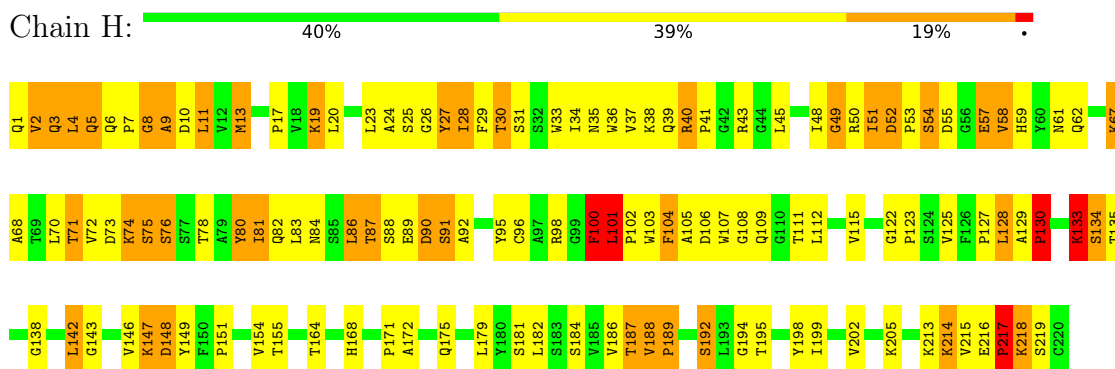
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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



• Molecule 2: ANTIBODY



4 Data and refinement statistics

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	67.10Å 75.80Å 111.20Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.90	Depositor
% Data completeness (in resolution range)	73.2 (8.00-2.90)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.8	Depositor
R, R_{free}	0.193 , 0.330	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3313	wwPDB-VP
Average B, all atoms (Å ²)	26.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

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

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	0.58	0/1696	1.06	11/2301 (0.5%)
2	H	0.62	0/1690	1.25	25/2310 (1.1%)
All	All	0.60	0/3386	1.16	36/4611 (0.8%)

There are no bond length outliers.

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	129	ALA	CA-C-N	9.24	131.38	119.84
2	H	129	ALA	C-N-CA	9.24	131.38	119.84
2	H	134	SER	N-CA-C	-9.23	102.01	113.18
2	H	61	ASN	N-CA-C	-8.07	98.33	110.28
1	L	43	SER	N-CA-C	-7.37	100.74	110.40
2	H	188	VAL	CA-C-N	7.16	128.79	119.84
2	H	188	VAL	C-N-CA	7.16	128.79	119.84
2	H	147	LYS	N-CA-C	7.10	120.13	110.55
2	H	101	LEU	CA-C-N	-6.78	112.60	120.12
2	H	101	LEU	C-N-CA	-6.78	112.60	120.12
1	L	133	VAL	N-CA-C	6.77	117.88	107.99
2	H	52	ASP	CA-C-N	6.71	128.23	119.84
2	H	52	ASP	C-N-CA	6.71	128.23	119.84
2	H	129	ALA	N-CA-C	6.53	117.60	109.57
2	H	49	GLY	N-CA-C	6.38	119.79	110.80
1	L	75	ILE	N-CA-C	-6.35	99.14	108.54
1	L	3	VAL	N-CA-C	6.25	117.09	108.84
1	L	50	GLY	N-CA-C	-5.89	101.07	111.80
1	L	42	GLN	N-CA-C	5.89	118.50	110.55
2	H	8	GLY	N-CA-C	5.87	119.74	112.64
2	H	75	SER	N-CA-C	-5.60	98.86	110.80
2	H	58	VAL	N-CA-C	5.56	116.49	108.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	76	SER	N-CA-C	-5.46	101.56	109.59
1	L	191	VAL	N-CA-C	5.41	116.09	108.36
1	L	9	LYS	N-CA-C	-5.40	105.05	111.69
2	H	13	MET	CA-C-N	5.38	125.32	119.78
2	H	13	MET	C-N-CA	5.38	125.32	119.78
1	L	115	VAL	N-CA-C	5.38	116.72	108.71
1	L	96	PHE	N-CA-C	-5.37	103.39	110.43
2	H	74	LYS	N-CA-C	-5.34	106.61	113.23
2	H	122	GLY	CA-C-N	5.34	125.33	120.21
2	H	122	GLY	C-N-CA	5.34	125.33	120.21
1	L	22	SER	N-CA-C	5.24	118.25	110.14
2	H	205	LYS	N-CA-C	5.17	121.24	109.81
2	H	86	LEU	N-CA-C	5.17	118.36	110.20
2	H	27	TYR	N-CA-C	5.05	118.87	111.04

There are no chirality outliers.

There are no planarity outliers.

5.2 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 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	1660	0	1598	84	0
2	H	1653	0	1617	123	0
All	All	3313	0	3215	199	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 30.

All (199) 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:4:LEU:HD21	2:H:98:ARG:HB2	1.39	1.01
2:H:218:LYS:HZ3	2:H:218:LYS:HA	1.32	0.94
2:H:101:LEU:HD13	2:H:102:PRO:HD2	1.49	0.93
2:H:192:SER:HA	2:H:195:THR:HB	1.56	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:6:GLN:HE22	2:H:95:TYR:HA	1.41	0.85
2:H:148:ASP:HB3	2:H:179:LEU:HD13	1.56	0.85
1:L:113:PRO:HB3	1:L:139:PHE:HB3	1.61	0.81
1:L:2:ILE:HG23	1:L:27:GLU:HG2	1.63	0.78
1:L:37:GLN:HB2	1:L:47:LEU:HD11	1.64	0.78
2:H:4:LEU:HA	2:H:23:LEU:HB3	1.65	0.77
2:H:39:GLN:HB2	2:H:45:LEU:HD23	1.68	0.74
2:H:50:ARG:HG3	2:H:59:HIS:HB2	1.70	0.73
2:H:103:TRP:HZ3	2:H:105:ALA:HB2	1.52	0.73
1:L:8:PRO:HG3	1:L:11:MET:HB2	1.68	0.73
1:L:46:LEU:HD11	1:L:49:TYR:HB3	1.70	0.73
1:L:120:PRO:HD3	1:L:132:VAL:HG22	1.71	0.72
2:H:29:PHE:CE2	2:H:74:LYS:HD3	2.23	0.72
2:H:36:TRP:CD1	2:H:70:LEU:HD11	2.24	0.72
2:H:27:TYR:O	2:H:28:ILE:HG13	1.90	0.71
2:H:73:ASP:HB3	2:H:76:SER:O	1.90	0.70
2:H:4:LEU:HD12	2:H:107:TRP:O	1.91	0.70
1:L:31:THR:HG23	1:L:51:ALA:CB	2.23	0.69
2:H:40:ARG:HA	2:H:92:ALA:HB1	1.74	0.69
1:L:115:VAL:HA	1:L:135:LEU:O	1.94	0.68
2:H:103:TRP:CZ3	2:H:105:ALA:HB2	2.28	0.68
1:L:98:PHE:HZ	2:H:104:PHE:HE2	1.42	0.68
2:H:33:TRP:CZ3	2:H:52:ASP:HB2	2.29	0.67
2:H:29:PHE:HE2	2:H:74:LYS:O	1.78	0.67
2:H:68:ALA:HA	2:H:82:GLN:O	1.95	0.66
2:H:34:ILE:O	2:H:50:ARG:HA	1.96	0.66
1:L:55:TYR:O	1:L:58:VAL:HG23	1.96	0.66
2:H:101:LEU:CD1	2:H:102:PRO:HD2	2.25	0.66
2:H:6:GLN:NE2	2:H:95:TYR:HA	2.10	0.65
1:L:31:THR:HG22	1:L:31:THR:O	1.97	0.65
1:L:91:SER:HA	1:L:96:PHE:CD1	2.32	0.65
1:L:106:ILE:HG12	1:L:107:LYS:N	2.13	0.64
1:L:161:GLU:HA	1:L:176:SER:O	1.98	0.64
1:L:31:THR:HG23	1:L:51:ALA:HB2	1.80	0.64
2:H:62:GLN:H	2:H:62:GLN:CD	2.07	0.63
2:H:35:ASN:O	2:H:96:CYS:HA	1.99	0.63
2:H:72:VAL:HG22	2:H:73:ASP:H	1.64	0.63
2:H:2:VAL:HG22	2:H:26:GLY:HA3	1.81	0.62
1:L:13:VAL:HG21	1:L:78:VAL:HG11	1.80	0.62
2:H:40:ARG:HA	2:H:92:ALA:CB	2.30	0.62
1:L:37:GLN:HB2	1:L:47:LEU:CD1	2.30	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:2:ILE:H	1:L:2:ILE:HD12	1.66	0.61
2:H:101:LEU:HB3	2:H:102:PRO:HD2	1.82	0.60
2:H:218:LYS:HA	2:H:218:LYS:NZ	2.14	0.60
1:L:9:LYS:O	1:L:102:THR:HA	2.01	0.60
1:L:47:LEU:O	1:L:58:VAL:HG21	2.01	0.59
1:L:14:SER:O	1:L:17:GLU:HG2	2.01	0.59
1:L:147:GLN:HB3	1:L:195:GLU:HB3	1.85	0.59
1:L:24:LYS:HA	1:L:69:THR:O	2.03	0.59
1:L:36:TYR:HA	1:L:45:LYS:O	2.03	0.58
2:H:123:PRO:HB3	2:H:149:TYR:HB3	1.84	0.58
2:H:52:ASP:HB3	2:H:55:ASP:OD1	2.03	0.58
1:L:12:TYR:HA	1:L:105:GLU:O	2.03	0.57
1:L:201:LEU:HB3	1:L:203:SER:O	2.04	0.57
2:H:33:TRP:CH2	2:H:52:ASP:HB2	2.39	0.57
1:L:59:PRO:HG2	1:L:62:PHE:HD1	1.70	0.56
2:H:38:LYS:HB2	2:H:48:ILE:HD11	1.87	0.56
2:H:218:LYS:HD3	2:H:219:SER:N	2.20	0.56
2:H:67:LYS:HG3	2:H:68:ALA:H	1.71	0.56
2:H:123:PRO:HB2	2:H:146:VAL:HG12	1.88	0.56
2:H:125:VAL:HG23	2:H:213:LYS:HE2	1.87	0.56
2:H:33:TRP:CZ3	2:H:50:ARG:NH2	2.74	0.55
2:H:2:VAL:HG21	2:H:27:TYR:CD2	2.43	0.54
2:H:73:ASP:HB2	2:H:80:TYR:HE1	1.72	0.54
2:H:133:LYS:HD2	2:H:135:THR:OG1	2.08	0.54
2:H:67:LYS:HG3	2:H:68:ALA:N	2.23	0.54
2:H:5:GLN:NE2	2:H:109:GLN:H	2.05	0.54
2:H:37:VAL:HG11	2:H:45:LEU:HD22	1.89	0.54
1:L:54:ARG:HD3	1:L:62:PHE:O	2.08	0.54
1:L:4:MET:HE1	1:L:33:VAL:HG22	1.90	0.54
2:H:19:LYS:HE2	2:H:80:TYR:CD2	2.44	0.53
2:H:30:THR:CG2	2:H:54:SER:HB3	2.38	0.53
2:H:28:ILE:HG22	2:H:31:SER:H	1.73	0.53
1:L:125:LEU:O	1:L:183:LYS:HD2	2.08	0.53
2:H:11:LEU:H	2:H:11:LEU:HD12	1.74	0.53
2:H:33:TRP:HH2	2:H:57:GLU:CD	2.16	0.53
1:L:8:PRO:CG	1:L:11:MET:HB2	2.39	0.52
1:L:119:PRO:HB3	1:L:209:PHE:CE2	2.44	0.52
2:H:142:LEU:HD22	2:H:215:VAL:HG23	1.90	0.52
2:H:154:VAL:HG13	2:H:154:VAL:O	2.08	0.52
2:H:19:LYS:HE2	2:H:80:TYR:HD2	1.74	0.52
2:H:218:LYS:NZ	2:H:219:SER:H	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:71:THR:OG1	2:H:80:TYR:HB2	2.09	0.51
1:L:44:PRO:HG2	2:H:45:LEU:HD11	1.92	0.51
2:H:100:PHE:HB2	2:H:105:ALA:HB2	1.93	0.51
1:L:79:GLN:NE2	1:L:80:ALA:HB3	2.25	0.51
1:L:105:GLU:HB3	1:L:166:GLN:OE1	2.10	0.51
2:H:2:VAL:HG21	2:H:27:TYR:CG	2.45	0.51
2:H:35:ASN:HA	2:H:49:GLY:O	2.10	0.51
1:L:192:TYR:HB2	1:L:209:PHE:CE1	2.45	0.51
2:H:17:PRO:HA	2:H:83:LEU:O	2.10	0.50
1:L:191:VAL:HG22	1:L:210:ASN:OD1	2.11	0.50
1:L:15:ILE:HD11	1:L:79:GLN:HA	1.93	0.49
1:L:12:TYR:HD2	1:L:140:TYR:HH	1.56	0.49
1:L:86:TYR:HE2	1:L:104:LEU:HD22	1.76	0.49
2:H:3:GLN:N	2:H:25:SER:HB2	2.27	0.49
1:L:163:VAL:HG23	1:L:174:SER:O	2.12	0.49
1:L:13:VAL:O	1:L:106:ILE:HA	2.13	0.49
2:H:23:LEU:HG	2:H:24:ALA:N	2.28	0.49
1:L:31:THR:HG23	1:L:51:ALA:HB3	1.95	0.49
1:L:59:PRO:HG2	1:L:62:PHE:CD1	2.48	0.49
2:H:147:LYS:NZ	2:H:175:GLN:HE22	2.11	0.49
1:L:181:LEU:HD13	1:L:186:TYR:HB2	1.95	0.48
2:H:130:PRO:HG2	2:H:217:PRO:N	2.27	0.48
2:H:67:LYS:CG	2:H:68:ALA:N	2.76	0.48
1:L:35:TRP:HB2	1:L:48:ILE:HB	1.95	0.48
2:H:216:GLU:HB2	2:H:217:PRO:HD2	1.96	0.48
2:H:29:PHE:HE2	2:H:74:LYS:HD3	1.75	0.48
2:H:101:LEU:CB	2:H:102:PRO:HD2	2.44	0.48
1:L:107:LYS:HA	1:L:140:TYR:OH	2.14	0.47
2:H:218:LYS:HD3	2:H:219:SER:H	1.79	0.47
1:L:25:ALA:O	1:L:69:THR:HG23	2.13	0.47
1:L:137:ASN:ND2	2:H:187:THR:HG21	2.30	0.47
1:L:15:ILE:CD1	1:L:79:GLN:HA	2.44	0.47
1:L:192:TYR:HB2	1:L:209:PHE:CD1	2.50	0.47
2:H:51:ILE:HB	2:H:58:VAL:HG12	1.96	0.47
2:H:98:ARG:NH2	2:H:106:ASP:HB2	2.29	0.47
1:L:122:ASP:O	1:L:126:LYS:HG2	2.14	0.47
2:H:67:LYS:HD3	2:H:67:LYS:C	2.39	0.47
1:L:121:SER:HB3	2:H:127:PRO:HG2	1.96	0.46
2:H:188:VAL:HG21	2:H:198:TYR:CZ	2.50	0.46
2:H:87:THR:C	2:H:89:GLU:H	2.22	0.46
1:L:31:THR:HA	1:L:51:ALA:HB2	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:5:GLN:HE22	2:H:109:GLN:H	1.64	0.46
1:L:154:LEU:HD23	1:L:155:GLN:O	2.15	0.46
1:L:130:ALA:HB3	1:L:181:LEU:HD12	1.97	0.46
2:H:3:GLN:NE2	2:H:4:LEU:H	2.13	0.46
2:H:4:LEU:CA	2:H:23:LEU:HB3	2.41	0.46
1:L:31:THR:O	1:L:31:THR:CG2	2.63	0.45
1:L:32:TYR:CG	1:L:92:TYR:HB2	2.52	0.45
2:H:8:GLY:O	2:H:9:ALA:HB2	2.15	0.45
2:H:50:ARG:CG	2:H:59:HIS:HB2	2.43	0.45
2:H:168:HIS:O	2:H:184:SER:HA	2.16	0.45
1:L:4:MET:HE1	1:L:33:VAL:CG2	2.46	0.45
1:L:61:ARG:HD2	1:L:82:ASP:OD2	2.16	0.45
1:L:186:TYR:O	1:L:192:TYR:OH	2.35	0.45
1:L:194:CYS:O	1:L:206:THR:HA	2.17	0.45
2:H:101:LEU:HB3	2:H:102:PRO:CD	2.46	0.45
2:H:199:ILE:HG12	2:H:214:LYS:HB2	1.99	0.45
1:L:94:TYR:OH	2:H:50:ARG:NH1	2.49	0.45
2:H:33:TRP:CH2	2:H:50:ARG:NH2	2.85	0.45
1:L:46:LEU:HD13	1:L:55:TYR:HB2	1.99	0.44
1:L:32:TYR:CD2	1:L:92:TYR:HB2	2.53	0.44
1:L:54:ARG:NE	1:L:60:ASP:HA	2.32	0.44
1:L:126:LYS:N	1:L:126:LYS:HE2	2.32	0.44
2:H:101:LEU:C	2:H:103:TRP:H	2.26	0.44
2:H:87:THR:OG1	2:H:89:GLU:HG2	2.18	0.44
1:L:86:TYR:CE2	1:L:104:LEU:HD22	2.53	0.44
1:L:98:PHE:CZ	2:H:104:PHE:HE2	2.28	0.44
2:H:192:SER:O	2:H:194:GLY:N	2.51	0.43
1:L:5:THR:O	1:L:23:CYS:HA	2.17	0.43
2:H:218:LYS:HZ2	2:H:219:SER:H	1.64	0.43
2:H:33:TRP:CH2	2:H:57:GLU:CD	2.95	0.43
2:H:81:ILE:HG12	2:H:82:GLN:N	2.31	0.43
1:L:136:LEU:HD11	1:L:196:VAL:CG2	2.48	0.43
2:H:30:THR:HG22	2:H:54:SER:HB3	2.00	0.43
2:H:33:TRP:CE3	2:H:52:ASP:HB2	2.53	0.43
2:H:138:GLY:O	2:H:189:PRO:HA	2.18	0.43
2:H:87:THR:O	2:H:90:ASP:HB2	2.19	0.43
2:H:130:PRO:HG2	2:H:217:PRO:HA	2.00	0.43
2:H:108:GLY:O	2:H:109:GLN:C	2.62	0.43
2:H:100:PHE:HD1	2:H:100:PHE:HA	1.65	0.43
2:H:23:LEU:HG	2:H:24:ALA:H	1.84	0.43
1:L:28:ASN:HD22	1:L:28:ASN:N	2.16	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:142:LEU:HD12	2:H:186:VAL:O	2.19	0.42
1:L:52:SER:HB3	1:L:64:GLY:O	2.19	0.42
2:H:130:PRO:HG2	2:H:217:PRO:CA	2.49	0.42
1:L:142:ARG:HB2	1:L:173:TYR:CE2	2.55	0.42
2:H:2:VAL:HG12	2:H:2:VAL:O	2.19	0.42
2:H:87:THR:OG1	2:H:88:SER:N	2.52	0.42
1:L:111:ALA:O	1:L:139:PHE:HA	2.20	0.42
1:L:2:ILE:HB	1:L:90:GLN:NE2	2.35	0.42
2:H:9:ALA:O	2:H:10:ASP:HB2	2.19	0.42
2:H:62:GLN:CD	2:H:62:GLN:N	2.75	0.42
2:H:91:SER:HB3	2:H:115:VAL:H	1.85	0.42
2:H:104:PHE:CD1	2:H:104:PHE:N	2.88	0.42
1:L:2:ILE:HG23	1:L:27:GLU:CG	2.42	0.41
1:L:163:VAL:HG22	1:L:164:THR:O	2.20	0.41
2:H:40:ARG:HA	2:H:41:PRO:HD3	1.94	0.41
2:H:29:PHE:CE2	2:H:74:LYS:O	2.67	0.41
2:H:128:LEU:HB2	2:H:143:GLY:C	2.46	0.41
1:L:118:PHE:CB	2:H:128:LEU:HD12	2.50	0.41
1:L:167:ASP:HB3	1:L:170:ASP:OD1	2.20	0.41
2:H:149:TYR:CZ	2:H:154:VAL:HG11	2.56	0.41
2:H:172:ALA:HB2	2:H:182:LEU:HD12	2.03	0.41
1:L:132:VAL:HG12	1:L:148:TRP:HH2	1.86	0.41
2:H:67:LYS:HE2	2:H:83:LEU:HB3	2.03	0.41
2:H:125:VAL:HG12	2:H:202:VAL:HG21	2.03	0.41
2:H:7:PRO:O	2:H:111:THR:HG23	2.20	0.40
2:H:172:ALA:HA	2:H:181:SER:O	2.21	0.40
1:L:146:VAL:HG13	1:L:194:CYS:SG	2.61	0.40
1:L:162:SER:OG	2:H:171:PRO:HD2	2.22	0.40
2:H:101:LEU:HD13	2:H:102:PRO:CD	2.34	0.40
1:L:29:VAL:O	1:L:32:TYR:HB2	2.21	0.40
2:H:30:THR:HG23	2:H:54:SER:HB3	2.02	0.40

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	L	212/214 (99%)	181 (85%)	28 (13%)	3 (1%)	9	30
2	H	218/220 (99%)	161 (74%)	42 (19%)	15 (7%)	1	2
All	All	430/434 (99%)	342 (80%)	70 (16%)	18 (4%)	2	9

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	28	ILE
2	H	133	LYS
2	H	101	LEU
1	L	30	ASP
1	L	143	GLU
2	H	189	PRO
2	H	192	SER
2	H	75	SER
2	H	100	PHE
2	H	130	PRO
2	H	9	ALA
2	H	148	ASP
1	L	110	VAL
2	H	54	SER
2	H	53	PRO
2	H	151	PRO
2	H	217	PRO
2	H	2	VAL

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	L	190/190 (100%)	168 (88%)	22 (12%)	5	18
2	H	186/186 (100%)	149 (80%)	37 (20%)	1	4

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	376/376 (100%)	317 (84%)	59 (16%)	2 9

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

Mol	Chain	Res	Type
1	L	7	SER
1	L	21	LEU
1	L	24	LYS
1	L	27	GLU
1	L	46	LEU
1	L	52	SER
1	L	78	VAL
1	L	90	GLN
1	L	93	ASN
1	L	102	THR
1	L	106	ILE
1	L	109	THR
1	L	124	GLN
1	L	135	LEU
1	L	142	ARG
1	L	145	LYS
1	L	147	GLN
1	L	161	GLU
1	L	181	LEU
1	L	183	LYS
1	L	185	ASP
1	L	201	LEU
2	H	3	GLN
2	H	4	LEU
2	H	5	GLN
2	H	11	LEU
2	H	13	MET
2	H	19	LYS
2	H	20	LEU
2	H	30	THR
2	H	40	ARG
2	H	43	ARG
2	H	51	ILE
2	H	57	GLU
2	H	67	LYS
2	H	71	THR
2	H	78	THR

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Mol	Chain	Res	Type
2	H	80	TYR
2	H	81	ILE
2	H	84	ASN
2	H	86	LEU
2	H	87	THR
2	H	90	ASP
2	H	91	SER
2	H	100	PHE
2	H	101	LEU
2	H	104	PHE
2	H	112	LEU
2	H	128	LEU
2	H	130	PRO
2	H	133	LYS
2	H	134	SER
2	H	142	LEU
2	H	155	THR
2	H	164	THR
2	H	187	THR
2	H	214	LYS
2	H	217	PRO
2	H	218	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	1	ASN
1	L	28	ASN
1	L	42	GLN
1	L	90	GLN
1	L	124	GLN
1	L	147	GLN
1	L	155	GLN
1	L	160	GLN
1	L	189	HIS
2	H	5	GLN
2	H	6	GLN
2	H	175	GLN
2	H	203	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or 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 length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	PCA	H	1	2	7,8,9	2.80	4 (57%)	9,10,12	2.93	3 (33%)

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	PCA	H	1	2	-	0/0/11/13	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	1	PCA	CB-CG	-5.73	1.40	1.53
2	H	1	PCA	OE-CD	2.79	1.28	1.23
2	H	1	PCA	CD-N	2.51	1.40	1.34
2	H	1	PCA	CG-CD	-2.45	1.44	1.50

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	1	PCA	CB-CG-CD	7.66	116.25	104.41
2	H	1	PCA	OE-CD-CG	3.27	132.55	126.72
2	H	1	PCA	CG-CD-N	-2.43	102.45	108.39

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides 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.