



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 10:40 AM UTC

PDB ID : 1NBQ / pdb_00001nbq
Title : Crystal Structure of Human Junctional Adhesion Molecule Type 1
Authors : Prota, A.E.; Campbell, J.A.; Schelling, P.; Forrest, J.C.; Watson, M.J.; Peters, T.R.; Aurrand-Lions, M.; Imhof, B.A.; Dermody, T.S.; Stehle, T.
Deposited on : 2002-12-03
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
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

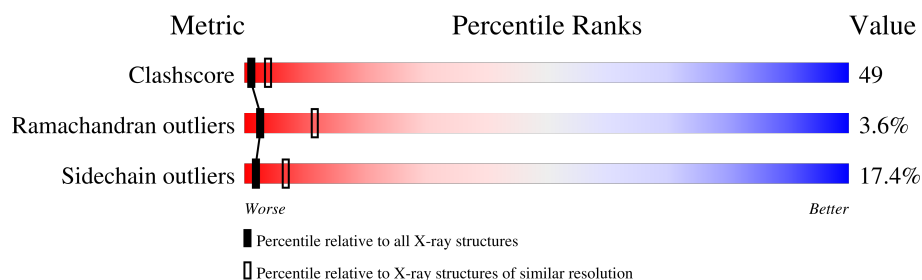
1 Overall quality at a glance

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	A	209	26% 51% 20% .
1	B	209	28% 48% 22% .

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 3299 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 Junctional adhesion molecule 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	209	Total	C	N	O	S	0	0	0
			1590	989	263	328	10			
1	B	208	Total	C	N	O	S	0	0	0
			1585	986	262	327	10			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	25	ALA	-	cloning artifact	UNP Q9Y624
A	26	MET	-	cloning artifact	UNP Q9Y624
B	25	ALA	-	cloning artifact	UNP Q9Y624
B	26	MET	-	cloning artifact	UNP Q9Y624

- Molecule 2 is water.

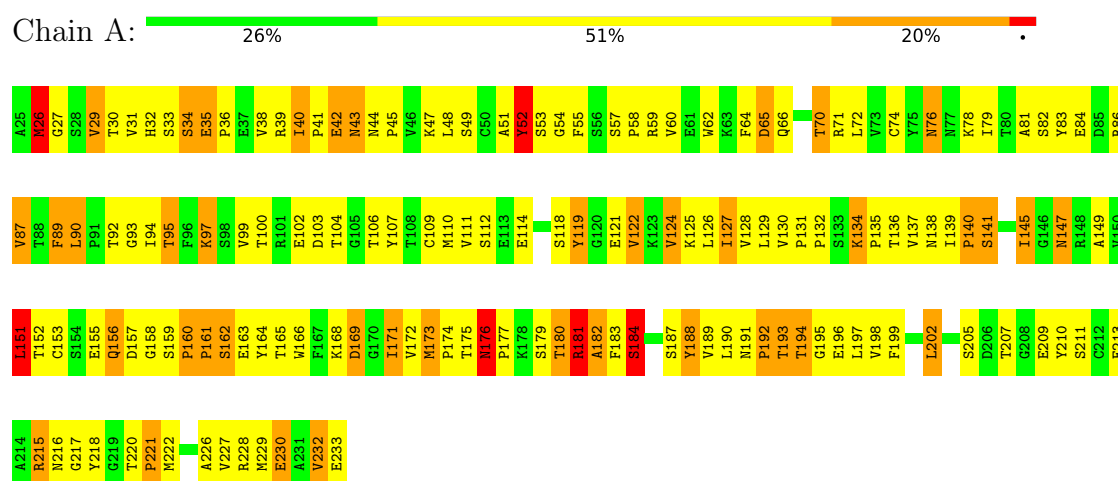
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	61	Total	O	0	0
			61	61		
2	B	63	Total	O	0	0
			63	63		

3 Residue-property plots

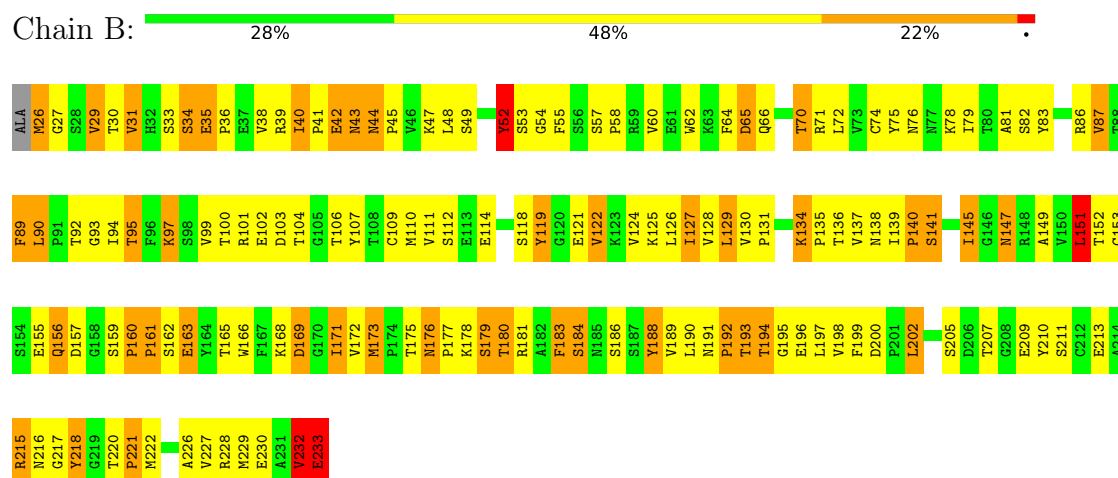
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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: Junctional adhesion molecule 1



• Molecule 1: Junctional adhesion molecule 1



4 Data and refinement statistics

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

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	116.80Å 61.80Å 82.90Å 90.00° 120.01° 90.00°	Depositor
Resolution (Å)	30.00 – 2.90	Depositor
% Data completeness (in resolution range)	10.0 (30.00-2.90)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.220 , 0.305	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3299	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

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	1.29	6/1626 (0.4%)	1.68	45/2216 (2.0%)
1	B	1.31	10/1621 (0.6%)	1.73	55/2209 (2.5%)
All	All	1.30	16/3247 (0.5%)	1.71	100/4425 (2.3%)

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
1	A	0	2
1	B	0	2
All	All	0	4

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	26	MET	SD-CE	8.64	2.01	1.79
1	B	130	VAL	CA-CB	7.43	1.59	1.54
1	B	222	MET	SD-CE	6.57	1.96	1.79
1	A	222	MET	SD-CE	6.47	1.95	1.79
1	A	26	MET	SD-CE	6.45	1.95	1.79
1	B	221	PRO	CA-C	6.09	1.58	1.52
1	A	221	PRO	CA-C	6.04	1.58	1.52
1	B	27	GLY	CA-C	5.98	1.58	1.52
1	B	171	ILE	CA-CB	5.92	1.60	1.53
1	A	171	ILE	CA-CB	5.82	1.60	1.53
1	B	26	MET	CG-SD	5.80	1.95	1.80
1	B	60	VAL	CA-CB	-5.64	1.47	1.54
1	A	60	VAL	CA-CB	-5.55	1.47	1.54
1	A	26	MET	CG-SD	5.03	1.93	1.80
1	B	27	GLY	N-CA	5.02	1.49	1.44
1	B	31	VAL	CA-CB	5.01	1.61	1.54

All (100) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	176	ASN	CA-C-N	11.17	130.58	118.97
1	A	176	ASN	C-N-CA	11.17	130.58	118.97
1	B	163	GLU	N-CA-C	-10.27	93.06	109.59
1	A	163	GLU	N-CA-C	-10.24	93.11	109.59
1	B	155	GLU	N-CA-C	-9.78	94.39	108.96
1	A	40	ILE	CA-C-N	9.75	129.87	120.31
1	A	40	ILE	C-N-CA	9.75	129.87	120.31
1	A	155	GLU	N-CA-C	-9.75	94.43	108.96
1	B	40	ILE	CA-C-N	9.67	129.79	120.31
1	B	40	ILE	C-N-CA	9.67	129.79	120.31
1	B	97	LYS	N-CA-C	-8.92	104.45	114.62
1	A	97	LYS	N-CA-C	-8.88	104.50	114.62
1	A	87	VAL	N-CA-C	8.79	121.26	107.98
1	B	87	VAL	N-CA-C	8.78	121.23	107.98
1	B	121	GLU	N-CA-C	8.55	121.74	107.20
1	A	121	GLU	N-CA-C	8.55	121.74	107.20
1	B	42	GLU	N-CA-C	8.44	122.16	110.35
1	A	42	GLU	N-CA-C	8.42	122.14	110.35
1	B	176	ASN	CA-C-N	7.92	129.74	119.84
1	B	176	ASN	C-N-CA	7.92	129.74	119.84
1	B	27	GLY	N-CA-C	-7.75	99.20	112.06
1	B	131	PRO	CA-C-N	-7.52	112.17	120.14
1	B	131	PRO	C-N-CA	-7.52	112.17	120.14
1	A	131	PRO	CA-C-N	-7.46	112.23	120.14
1	A	131	PRO	C-N-CA	-7.46	112.23	120.14
1	B	183	PHE	N-CA-C	7.37	122.27	113.28
1	A	188	TYR	N-CA-C	7.33	120.47	110.35
1	B	27	GLY	CA-C-N	-7.30	113.06	122.77
1	B	27	GLY	C-N-CA	-7.30	113.06	122.77
1	B	27	GLY	CA-C-O	-7.30	113.56	121.88
1	B	188	TYR	N-CA-C	7.28	120.40	110.35
1	B	157	ASP	N-CA-C	-7.11	106.52	114.62
1	A	169	ASP	N-CA-C	-7.04	104.64	113.23
1	A	194	THR	N-CA-C	-7.01	105.35	114.04
1	B	169	ASP	N-CA-C	-7.00	104.69	113.23
1	B	194	THR	N-CA-C	-6.96	105.40	114.04
1	B	173	MET	CA-C-N	6.78	128.31	119.84
1	B	173	MET	C-N-CA	6.78	128.31	119.84
1	A	173	MET	CA-C-N	6.74	128.27	119.84
1	A	173	MET	C-N-CA	6.74	128.27	119.84
1	A	29	VAL	N-CA-C	6.73	118.52	108.96
1	A	35	GLU	CA-C-N	6.72	128.24	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	35	GLU	C-N-CA	6.72	128.24	119.84
1	B	29	VAL	N-CA-C	6.72	118.50	108.96
1	B	35	GLU	CA-C-N	6.67	128.17	119.84
1	B	35	GLU	C-N-CA	6.67	128.17	119.84
1	B	70	THR	CB-CA-C	-6.58	102.52	110.94
1	A	121	GLU	CB-CA-C	-6.45	103.44	111.43
1	B	121	GLU	CB-CA-C	-6.40	103.49	111.43
1	A	89	PHE	N-CA-C	6.21	119.52	109.40
1	B	89	PHE	N-CA-C	6.21	119.51	109.40
1	B	27	GLY	O-C-N	-6.20	118.20	123.59
1	B	43	ASN	N-CA-C	6.08	123.74	110.80
1	A	43	ASN	N-CA-C	6.05	123.69	110.80
1	A	198	VAL	N-CA-C	5.98	117.28	107.24
1	B	198	VAL	N-CA-C	5.97	117.27	107.24
1	A	160	PRO	CA-C-N	5.97	127.30	119.84
1	A	160	PRO	C-N-CA	5.97	127.30	119.84
1	B	160	PRO	CA-C-N	5.95	127.28	119.84
1	B	160	PRO	C-N-CA	5.95	127.28	119.84
1	A	70	THR	CB-CA-C	-5.93	102.54	110.79
1	A	90	LEU	N-CA-C	5.91	117.77	108.55
1	B	90	LEU	N-CA-C	5.89	117.74	108.55
1	B	72	LEU	N-CA-C	5.72	118.62	110.10
1	A	72	LEU	N-CA-C	5.67	118.55	110.10
1	B	232	VAL	CA-C-N	5.64	131.85	121.70
1	B	232	VAL	C-N-CA	5.64	131.85	121.70
1	A	184	SER	N-CA-C	5.61	122.74	110.80
1	B	195	GLY	N-CA-C	-5.58	108.04	115.40
1	A	189	VAL	N-CA-C	-5.55	101.02	108.35
1	A	134	LYS	N-CA-C	5.55	117.65	109.50
1	B	134	LYS	N-CA-C	5.54	117.64	109.50
1	A	195	GLY	N-CA-C	-5.53	108.10	115.40
1	B	189	VAL	N-CA-C	-5.53	101.05	108.35
1	A	221	PRO	N-CA-C	5.50	119.24	110.21
1	A	182	ALA	N-CA-C	-5.49	99.11	110.80
1	B	220	THR	CB-CA-C	-5.49	101.49	109.45
1	B	221	PRO	N-CA-C	5.48	119.20	110.21
1	A	220	THR	CB-CA-C	-5.46	101.53	109.45
1	A	35	GLU	N-CA-C	5.35	118.91	108.21
1	B	35	GLU	N-CA-C	5.34	118.90	108.21
1	A	124	VAL	N-CA-C	5.32	116.45	109.21
1	A	151	LEU	N-CA-C	-5.31	101.69	109.81
1	B	129	LEU	N-CA-C	5.30	118.27	109.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	151	LEU	N-CA-C	-5.29	101.71	109.81
1	B	124	VAL	N-CA-C	5.28	116.39	109.21
1	B	44	ASN	CA-C-N	-5.28	115.14	120.31
1	B	44	ASN	C-N-CA	-5.28	115.14	120.31
1	B	180	THR	N-CA-C	5.27	122.03	110.80
1	A	44	ASN	CA-C-N	-5.23	115.18	120.31
1	A	44	ASN	C-N-CA	-5.23	115.18	120.31
1	A	202	LEU	N-CA-C	-5.15	101.31	109.96
1	B	202	LEU	N-CA-C	-5.14	101.32	109.96
1	A	153	CYS	N-CA-C	-5.09	101.55	109.24
1	B	81	ALA	N-CA-C	5.09	117.22	111.02
1	A	81	ALA	N-CA-C	5.08	117.22	111.02
1	B	153	CYS	N-CA-C	-5.05	101.62	109.24
1	B	233	GLU	CB-CA-C	5.04	119.67	110.10
1	B	218	TYR	N-CA-C	5.03	117.60	109.40
1	A	218	TYR	N-CA-C	5.02	117.58	109.40

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	164	TYR	Sidechain
1	A	52	TYR	Sidechain
1	B	232	VAL	Mainchain
1	B	52	TYR	Sidechain

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	A	1590	0	1528	152	0
1	B	1585	0	1523	165	0
2	A	61	0	0	26	0
2	B	63	0	0	31	0
All	All	3299	0	3051	305	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 49.

All (305) 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)
1:B:79:ILE:HD11	1:B:89:PHE:HB2	1.25	1.14
1:A:140:PRO:HB2	2:A:294:HOH:O	1.52	1.10
1:A:79:ILE:HD11	1:A:89:PHE:HB2	1.25	1.07
1:B:166:TRP:HB3	1:B:173:MET:HG3	1.41	1.03
1:A:166:TRP:HB3	1:A:173:MET:HG3	1.41	1.01
1:B:140:PRO:HB2	2:B:286:HOH:O	1.58	1.01
1:A:192:PRO:HD3	2:A:291:HOH:O	1.63	0.98
1:B:41:PRO:HD2	2:B:292:HOH:O	1.66	0.95
1:B:136:THR:HG22	2:B:244:HOH:O	1.64	0.95
1:A:132:PRO:HB3	2:A:282:HOH:O	1.68	0.94
1:B:41:PRO:HG3	1:B:129:LEU:HB2	1.49	0.94
1:B:65:ASP:HB2	2:B:272:HOH:O	1.68	0.93
1:B:152:THR:HB	2:B:277:HOH:O	1.72	0.89
1:B:173:MET:HA	2:B:269:HOH:O	1.74	0.86
1:A:41:PRO:HG3	1:A:129:LEU:HB2	1.58	0.85
1:A:79:ILE:CD1	1:A:89:PHE:HB2	2.07	0.85
1:B:86:ARG:HG2	2:B:255:HOH:O	1.76	0.84
1:B:79:ILE:CD1	1:B:89:PHE:HB2	2.07	0.82
1:A:175:THR:HA	1:A:190:LEU:HD12	1.63	0.81
1:B:175:THR:HA	1:B:190:LEU:HD12	1.63	0.81
1:B:137:VAL:HG22	2:B:259:HOH:O	1.81	0.80
1:A:215:ARG:HB3	1:A:221:PRO:HB3	1.64	0.79
1:B:215:ARG:HB3	1:B:221:PRO:HB3	1.64	0.79
1:A:137:VAL:O	1:B:141:SER:HB3	1.83	0.79
1:A:141:SER:HB3	1:B:137:VAL:O	1.83	0.79
1:A:232:VAL:HG21	1:B:136:THR:HG21	1.66	0.78
1:A:27:GLY:HA2	2:A:287:HOH:O	1.85	0.77
1:A:166:TRP:CB	1:A:173:MET:HG3	2.15	0.77
1:A:62:TRP:H	1:A:74:CYS:HB3	1.50	0.77
1:B:166:TRP:CB	1:B:173:MET:HG3	2.15	0.77
1:A:124:VAL:HG21	2:A:279:HOH:O	1.87	0.75
1:B:62:TRP:H	1:B:74:CYS:HB3	1.50	0.75
1:A:136:THR:HG21	1:B:232:VAL:HG21	1.68	0.75
1:A:65:ASP:HB2	2:A:236:HOH:O	1.87	0.74
1:B:215:ARG:HA	2:B:262:HOH:O	1.87	0.73
1:B:186:SER:HG	1:B:188:TYR:HD2	1.37	0.72
1:A:192:PRO:HG2	2:A:267:HOH:O	1.88	0.72
1:B:102:GLU:HG3	2:B:258:HOH:O	1.89	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:GLU:HA	2:A:240:HOH:O	1.91	0.71
1:B:104:THR:HG23	1:B:127:ILE:HA	1.73	0.71
1:A:104:THR:HG23	1:A:127:ILE:HA	1.73	0.70
1:A:216:ASN:HB3	2:A:282:HOH:O	1.92	0.70
1:B:149:ALA:HB3	1:B:199:PHE:HB2	1.76	0.68
1:A:174:PRO:HD2	1:A:183:PHE:CD2	2.28	0.68
1:A:149:ALA:HB3	1:A:199:PHE:HB2	1.76	0.68
1:B:106:THR:HG23	1:B:125:LYS:HG3	1.76	0.67
1:B:217:GLY:HA2	2:B:290:HOH:O	1.94	0.67
1:A:106:THR:HG23	1:A:125:LYS:HG3	1.76	0.67
1:A:52:TYR:HE1	1:A:58:PRO:HG3	1.60	0.66
1:A:47:LYS:HB2	1:A:95:THR:HG22	1.79	0.65
1:B:151:LEU:HD21	1:B:229:MET:HE1	1.78	0.65
1:A:39:ARG:HG2	1:A:127:ILE:CG2	2.27	0.65
1:B:52:TYR:HE1	1:B:58:PRO:HG3	1.60	0.65
1:B:39:ARG:HG2	1:B:127:ILE:CG2	2.27	0.65
1:B:31:VAL:HG21	2:B:280:HOH:O	1.97	0.65
1:B:44:ASN:ND2	2:B:292:HOH:O	2.29	0.65
1:B:45:PRO:HG3	1:B:97:LYS:O	1.97	0.65
1:A:45:PRO:HG3	1:A:97:LYS:O	1.97	0.64
1:B:151:LEU:HD11	1:B:229:MET:HE1	1.80	0.64
1:B:47:LYS:HB2	1:B:95:THR:HG22	1.79	0.64
1:A:151:LEU:HD21	1:A:229:MET:HE1	1.78	0.64
1:B:183:PHE:CZ	2:B:269:HOH:O	2.50	0.64
1:A:151:LEU:HD11	1:A:229:MET:HE1	1.80	0.64
1:A:86:ARG:HG2	2:A:264:HOH:O	1.97	0.64
1:B:176:ASN:O	1:B:181:ARG:HG3	1.98	0.64
1:A:52:TYR:H	1:A:52:TYR:HD2	1.46	0.63
1:A:230:GLU:HB3	2:A:276:HOH:O	1.98	0.63
1:B:31:VAL:HG11	2:B:280:HOH:O	1.98	0.63
1:B:52:TYR:H	1:B:52:TYR:HD2	1.46	0.63
1:A:138:ASN:HA	1:B:141:SER:CB	2.28	0.63
1:B:36:PRO:HG2	2:B:252:HOH:O	1.98	0.63
1:A:174:PRO:HD2	1:A:183:PHE:CE2	2.34	0.62
1:A:32:HIS:HB3	2:A:258:HOH:O	1.97	0.62
1:A:194:THR:HG22	2:A:292:HOH:O	1.99	0.62
1:A:39:ARG:HG2	1:A:127:ILE:HG22	1.82	0.62
1:B:39:ARG:HG2	1:B:127:ILE:HG22	1.82	0.62
1:B:33:SER:CB	1:B:122:VAL:HG21	2.30	0.62
1:B:192:PRO:HG2	2:B:296:HOH:O	2.00	0.62
1:B:57:SER:O	1:B:114:GLU:HG2	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:232:VAL:HG12	1:B:233:GLU:H	1.65	0.61
1:A:33:SER:CB	1:A:122:VAL:HG21	2.30	0.61
1:A:180:THR:O	1:A:181:ARG:HG2	2.00	0.61
1:A:141:SER:CB	1:B:138:ASN:HA	2.31	0.61
1:A:57:SER:O	1:A:114:GLU:HG2	2.00	0.60
1:B:41:PRO:HA	1:B:129:LEU:H	1.67	0.60
1:B:101:ARG:HB2	2:B:240:HOH:O	2.00	0.60
1:A:79:ILE:HD11	1:A:89:PHE:CB	2.17	0.59
1:B:218:TYR:HA	2:B:289:HOH:O	2.01	0.59
1:A:138:ASN:HA	1:B:141:SER:HB3	1.84	0.59
1:B:41:PRO:CG	1:B:129:LEU:HB2	2.27	0.58
1:A:52:TYR:HE1	1:A:58:PRO:CG	2.16	0.58
1:B:112:SER:HB3	1:B:119:TYR:HD1	1.68	0.58
1:B:52:TYR:HE1	1:B:58:PRO:CG	2.16	0.58
1:B:190:LEU:HD13	2:B:274:HOH:O	2.03	0.58
1:B:186:SER:OG	1:B:188:TYR:HD2	1.86	0.57
1:B:41:PRO:HG3	1:B:129:LEU:HD12	1.86	0.57
1:B:137:VAL:HA	2:B:276:HOH:O	2.04	0.57
1:A:152:THR:HB	2:A:278:HOH:O	2.03	0.57
1:B:40:ILE:O	1:B:128:VAL:HA	2.04	0.57
1:B:79:ILE:HD11	1:B:89:PHE:CB	2.17	0.57
1:B:177:PRO:HG2	1:B:178:LYS:H	1.70	0.57
1:B:159:SER:HA	1:B:160:PRO:C	2.30	0.57
1:A:40:ILE:O	1:A:128:VAL:HA	2.04	0.56
1:A:112:SER:HB3	1:A:119:TYR:HD1	1.69	0.56
1:A:141:SER:HB3	1:B:138:ASN:HA	1.86	0.56
1:A:141:SER:OG	1:B:227:VAL:HG21	2.04	0.56
1:B:191:ASN:O	1:B:193:THR:N	2.39	0.56
1:A:159:SER:HA	1:A:160:PRO:C	2.30	0.56
1:A:213:GLU:HG2	1:A:221:PRO:HB2	1.88	0.56
1:B:151:LEU:CD2	1:B:229:MET:HE1	2.35	0.56
1:A:151:LEU:CD2	1:A:229:MET:HE1	2.35	0.56
1:A:191:ASN:O	1:A:193:THR:N	2.39	0.56
1:B:188:TYR:CE1	1:B:190:LEU:HG	2.41	0.56
1:B:99:VAL:HG23	1:B:128:VAL:HG11	1.88	0.56
1:A:99:VAL:HG23	1:A:128:VAL:HG11	1.88	0.56
1:B:215:ARG:HG2	2:B:275:HOH:O	2.06	0.56
1:B:111:VAL:HG23	2:B:280:HOH:O	2.06	0.55
1:B:213:GLU:HG2	1:B:221:PRO:HB2	1.88	0.55
1:A:188:TYR:CE1	1:A:190:LEU:HG	2.41	0.55
1:B:178:LYS:O	1:B:179:SER:HB2	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:129:LEU:HB3	1:B:218:TYR:CD2	2.42	0.55
1:A:217:GLY:HA2	2:A:272:HOH:O	2.07	0.54
1:B:55:PHE:HB3	1:B:58:PRO:HB3	1.89	0.54
1:A:52:TYR:CE1	1:A:58:PRO:HG3	2.42	0.54
1:B:52:TYR:CE1	1:B:58:PRO:HG3	2.42	0.54
1:B:86:ARG:NH1	1:B:103:ASP:OD2	2.41	0.54
1:A:86:ARG:NH1	1:A:103:ASP:OD2	2.41	0.53
1:B:83:TYR:HB3	1:B:87:VAL:HB	1.90	0.53
1:A:34:SER:N	2:A:259:HOH:O	2.41	0.53
1:A:227:VAL:HG21	1:B:141:SER:OG	2.07	0.53
1:B:52:TYR:HD1	1:B:111:VAL:HG11	1.73	0.53
1:B:213:GLU:CG	1:B:221:PRO:HB2	2.38	0.53
1:B:156:GLN:O	1:B:156:GLN:HG2	2.08	0.53
1:A:55:PHE:HB3	1:A:58:PRO:HB3	1.89	0.53
1:A:83:TYR:HB3	1:A:87:VAL:HB	1.90	0.53
1:A:179:SER:O	1:A:184:SER:HB3	2.07	0.53
1:B:147:ASN:N	1:B:147:ASN:ND2	2.57	0.53
1:A:129:LEU:HA	1:A:159:SER:O	2.09	0.53
1:A:156:GLN:O	1:A:156:GLN:HG2	2.08	0.53
1:B:99:VAL:HG23	1:B:128:VAL:CG1	2.39	0.53
1:A:138:ASN:HA	1:B:141:SER:HB2	1.92	0.52
1:A:52:TYR:HD1	1:A:111:VAL:HG11	1.73	0.52
1:A:99:VAL:HG23	1:A:128:VAL:CG1	2.39	0.52
1:A:86:ARG:HG3	1:A:87:VAL:HG23	1.92	0.52
1:A:213:GLU:CG	1:A:221:PRO:HB2	2.38	0.52
1:B:47:LYS:O	1:B:48:LEU:HD23	2.10	0.52
1:B:163:GLU:HG3	2:B:266:HOH:O	2.09	0.52
1:B:147:ASN:ND2	1:B:147:ASN:H	2.08	0.51
1:A:47:LYS:O	1:A:48:LEU:HD23	2.10	0.51
1:A:174:PRO:CD	1:A:183:PHE:CE2	2.93	0.51
1:A:168:LYS:O	1:A:169:ASP:HB2	2.09	0.51
1:B:86:ARG:HG3	1:B:87:VAL:HG23	1.92	0.51
1:A:147:ASN:N	1:A:147:ASN:ND2	2.57	0.51
1:B:168:LYS:O	1:B:169:ASP:HB2	2.09	0.51
1:B:151:LEU:CD1	1:B:229:MET:HE1	2.41	0.51
1:B:183:PHE:HD2	1:B:188:TYR:HE2	1.57	0.51
1:A:147:ASN:ND2	1:A:147:ASN:H	2.08	0.51
1:A:26:MET:HE3	2:A:285:HOH:O	2.11	0.50
1:A:76:ASN:ND2	2:A:289:HOH:O	2.40	0.50
1:A:48:LEU:HB2	1:A:94:ILE:HG13	1.93	0.50
1:B:33:SER:HB2	1:B:122:VAL:HG21	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:33:SER:HB2	1:A:122:VAL:HG21	1.92	0.50
1:A:93:GLY:CA	2:A:241:HOH:O	2.59	0.50
1:B:41:PRO:HG3	1:B:129:LEU:CD1	2.40	0.50
1:B:218:TYR:HD1	2:B:289:HOH:O	1.94	0.50
1:B:29:VAL:HG12	1:B:54:GLY:C	2.36	0.50
1:A:209:GLU:HG3	1:A:226:ALA:HB1	1.92	0.50
1:B:209:GLU:HG3	1:B:226:ALA:HB1	1.92	0.50
1:A:151:LEU:CD1	1:A:229:MET:HE1	2.41	0.49
1:B:42:GLU:O	1:B:43:ASN:HB2	2.12	0.49
1:A:29:VAL:HG12	1:A:54:GLY:C	2.36	0.49
1:A:140:PRO:HD2	1:A:229:MET:HE2	1.93	0.49
1:B:48:LEU:HB2	1:B:94:ILE:HG13	1.93	0.49
1:A:42:GLU:O	1:A:43:ASN:HB2	2.12	0.49
1:B:160:PRO:O	1:B:216:ASN:HB2	2.13	0.49
1:A:141:SER:HB2	1:B:138:ASN:HA	1.94	0.49
1:B:30:THR:HG22	1:B:53:SER:O	2.13	0.49
1:B:38:VAL:HG12	1:B:39:ARG:N	2.27	0.49
1:A:30:THR:HG22	1:A:53:SER:O	2.13	0.49
1:B:145:ILE:O	1:B:145:ILE:HG22	2.12	0.49
1:A:160:PRO:O	1:A:216:ASN:HB2	2.13	0.49
1:A:176:ASN:HA	1:A:177:PRO:HD2	1.60	0.49
1:B:90:LEU:HB2	1:B:93:GLY:O	2.13	0.49
1:A:38:VAL:HG12	1:A:39:ARG:N	2.27	0.49
1:A:145:ILE:HD12	1:A:233:GLU:HB3	1.95	0.49
1:A:145:ILE:HG22	1:A:145:ILE:O	2.12	0.48
1:A:59:ARG:HD2	1:A:76:ASN:ND2	2.28	0.48
1:B:48:LEU:HB2	1:B:94:ILE:CG1	2.44	0.48
1:B:48:LEU:O	1:B:93:GLY:HA3	2.13	0.48
1:B:140:PRO:HD2	1:B:229:MET:HE2	1.93	0.48
1:B:197:LEU:HG	1:B:199:PHE:HE1	1.79	0.48
1:B:228:ARG:HG3	1:B:229:MET:N	2.27	0.48
1:A:29:VAL:HG12	1:A:54:GLY:HA3	1.96	0.48
1:A:228:ARG:HG3	1:A:229:MET:N	2.27	0.48
1:A:48:LEU:HB2	1:A:94:ILE:CG1	2.44	0.48
1:A:90:LEU:HB2	1:A:93:GLY:O	2.13	0.48
1:A:35:GLU:HA	1:A:36:PRO:HD2	1.61	0.48
1:B:41:PRO:HG3	1:B:129:LEU:CB	2.34	0.48
1:B:101:ARG:HD2	2:B:295:HOH:O	2.14	0.47
1:A:48:LEU:O	1:A:93:GLY:HA3	2.13	0.47
1:B:109:CYS:C	1:B:110:MET:HG3	2.40	0.47
1:A:181:ARG:HA	1:A:181:ARG:HD3	1.51	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:41:PRO:HD3	1:B:129:LEU:HD12	1.96	0.47
1:A:197:LEU:HG	1:A:199:PHE:HE1	1.79	0.47
1:B:29:VAL:HG12	1:B:54:GLY:HA3	1.96	0.47
1:B:52:TYR:CD1	1:B:111:VAL:HG11	2.49	0.47
1:B:233:GLU:O	1:B:233:GLU:HG3	2.15	0.47
1:A:64:PHE:CD1	1:A:107:TYR:CZ	3.03	0.47
1:A:109:CYS:C	1:A:110:MET:HG3	2.40	0.47
1:B:168:LYS:HG2	2:B:245:HOH:O	2.13	0.47
1:A:93:GLY:HA2	2:A:241:HOH:O	2.15	0.47
1:A:166:TRP:HZ3	1:A:210:TYR:HB3	1.79	0.47
1:B:64:PHE:CD1	1:B:107:TYR:CZ	3.03	0.47
1:B:166:TRP:HZ3	1:B:210:TYR:HB3	1.79	0.46
1:B:181:ARG:C	1:B:183:PHE:H	2.23	0.46
1:B:188:TYR:HE1	1:B:190:LEU:HG	1.80	0.46
1:B:194:THR:C	1:B:196:GLU:H	2.24	0.46
1:A:174:PRO:C	1:A:176:ASN:N	2.72	0.46
1:B:139:ILE:HD12	1:B:139:ILE:N	2.31	0.46
1:A:52:TYR:CD1	1:A:111:VAL:HG11	2.49	0.46
1:B:41:PRO:CD	1:B:129:LEU:HD12	2.46	0.46
1:B:173:MET:HB2	2:B:274:HOH:O	2.16	0.46
1:A:33:SER:HA	2:A:259:HOH:O	2.16	0.46
1:A:139:ILE:N	1:A:139:ILE:HD12	2.31	0.46
1:A:35:GLU:HB3	2:A:261:HOH:O	2.14	0.46
1:A:188:TYR:HE1	1:A:190:LEU:HG	1.80	0.46
1:A:83:TYR:HB3	1:A:87:VAL:CG2	2.47	0.45
1:B:99:VAL:CG2	1:B:128:VAL:HG13	2.47	0.45
1:A:51:ALA:HA	2:A:234:HOH:O	2.16	0.45
1:A:194:THR:CG2	1:A:196:GLU:HB2	2.46	0.45
1:B:33:SER:O	1:B:34:SER:C	2.60	0.45
1:A:112:SER:HB3	1:A:119:TYR:CD1	2.50	0.45
1:A:64:PHE:HE1	1:A:107:TYR:CE1	2.35	0.45
1:A:130:VAL:O	1:A:158:GLY:HA2	2.17	0.45
1:A:194:THR:C	1:A:196:GLU:H	2.24	0.45
1:A:99:VAL:CG2	1:A:128:VAL:HG13	2.47	0.45
1:B:112:SER:HB3	1:B:119:TYR:CD1	2.50	0.45
1:B:145:ILE:HD12	1:B:233:GLU:OXT	2.17	0.45
1:B:41:PRO:CG	1:B:129:LEU:HD12	2.46	0.45
1:B:64:PHE:HE1	1:B:107:TYR:CE1	2.35	0.44
1:B:194:THR:CG2	1:B:196:GLU:HB2	2.46	0.44
1:B:83:TYR:HB3	1:B:87:VAL:CG2	2.47	0.44
1:A:177:PRO:O	1:A:184:SER:HA	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:179:SER:O	1:B:181:ARG:N	2.50	0.44
1:B:64:PHE:CE1	1:B:107:TYR:CZ	3.06	0.44
1:A:168:LYS:HE3	2:A:249:HOH:O	2.18	0.44
1:B:41:PRO:HA	1:B:129:LEU:N	2.30	0.44
1:B:64:PHE:O	1:B:70:THR:HA	2.17	0.44
1:A:31:VAL:HG12	1:A:122:VAL:HG12	1.99	0.44
1:B:52:TYR:CD2	1:B:52:TYR:N	2.86	0.44
1:A:33:SER:HB3	1:A:122:VAL:HG21	2.00	0.44
1:A:52:TYR:CD2	1:A:52:TYR:N	2.86	0.44
1:A:194:THR:HG22	1:A:196:GLU:HB2	2.00	0.44
1:B:176:ASN:HA	1:B:177:PRO:HD2	1.57	0.44
1:B:62:TRP:N	1:B:74:CYS:HB3	2.26	0.44
1:A:207:THR:HA	1:A:229:MET:O	2.18	0.43
1:B:33:SER:HB3	1:B:122:VAL:HG21	2.00	0.43
1:B:181:ARG:C	1:B:183:PHE:N	2.76	0.43
1:A:166:TRP:CZ3	1:A:210:TYR:HB3	2.53	0.43
1:A:64:PHE:CE1	1:A:107:TYR:CZ	3.06	0.43
1:A:64:PHE:O	1:A:70:THR:HA	2.18	0.43
1:A:180:THR:O	1:A:181:ARG:CG	2.66	0.43
1:B:75:TYR:CD2	1:B:76:ASN:HB2	2.53	0.43
1:B:86:ARG:NE	2:B:255:HOH:O	2.49	0.43
1:B:31:VAL:HG12	1:B:122:VAL:HG12	1.99	0.43
1:B:207:THR:HA	1:B:229:MET:O	2.18	0.43
1:A:33:SER:O	1:A:34:SER:C	2.60	0.43
1:B:35:GLU:HA	1:B:36:PRO:HD2	1.61	0.43
1:B:166:TRP:CZ3	1:B:210:TYR:HB3	2.53	0.42
1:B:194:THR:HG22	1:B:196:GLU:HB2	2.00	0.42
1:A:62:TRP:N	1:A:74:CYS:HB3	2.26	0.42
1:B:166:TRP:CE3	1:B:211:SER:O	2.72	0.42
1:A:166:TRP:CE3	1:A:211:SER:O	2.72	0.42
1:A:100:THR:C	1:A:102:GLU:H	2.26	0.42
1:A:130:VAL:CG1	1:A:157:ASP:O	2.68	0.42
1:A:26:MET:HE1	1:A:29:VAL:HG22	2.01	0.42
1:B:134:LYS:HA	1:B:135:PRO:HD2	1.96	0.42
1:B:65:ASP:OD2	1:B:70:THR:HG23	2.20	0.41
1:A:64:PHE:CE1	1:A:107:TYR:CE1	3.08	0.41
1:B:64:PHE:CE1	1:B:107:TYR:CE1	3.08	0.41
1:A:36:PRO:HG2	2:A:260:HOH:O	2.20	0.41
1:B:173:MET:HE2	1:B:197:LEU:HD21	2.03	0.41
1:B:100:THR:C	1:B:102:GLU:H	2.26	0.41
1:A:126:LEU:HD12	1:A:127:ILE:H	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:162:SER:HB3	2:A:282:HOH:O	2.19	0.41
1:A:65:ASP:OD2	1:A:70:THR:HG23	2.21	0.41
1:B:47:LYS:HB2	1:B:95:THR:CG2	2.47	0.41
1:B:48:LEU:HA	2:B:281:HOH:O	2.20	0.41
1:B:202:LEU:HD12	1:B:202:LEU:HA	1.92	0.41
1:A:140:PRO:HD2	1:A:151:LEU:HD22	2.03	0.41
1:B:183:PHE:HZ	2:B:269:HOH:O	1.99	0.41
1:A:35:GLU:HA	1:A:35:GLU:OE1	2.21	0.40
1:A:173:MET:HE2	1:A:197:LEU:HD21	2.03	0.40
1:B:107:TYR:N	1:B:107:TYR:CD1	2.90	0.40
1:B:126:LEU:HD12	1:B:127:ILE:H	1.86	0.40
1:B:183:PHE:N	1:B:183:PHE:CD1	2.88	0.40
1:A:107:TYR:CD1	1:A:107:TYR:N	2.90	0.40
1:B:199:PHE:O	1:B:200:ASP:HB2	2.21	0.40
1:A:202:LEU:HD12	1:A:202:LEU:HA	1.92	0.40
1:B:30:THR:O	1:B:52:TYR:HA	2.22	0.40
1:A:30:THR:O	1:A:52:TYR:HA	2.22	0.40
1:A:134:LYS:HA	1:A:135:PRO:HD2	1.96	0.40
1:A:174:PRO:CD	1:A:183:PHE:CD2	3.03	0.40
1:A:190:LEU:HD23	1:A:190:LEU:HA	1.89	0.40
1:B:35:GLU:HA	1:B:35:GLU:OE1	2.21	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	A	207/209 (99%)	171 (83%)	28 (14%)	8 (4%)	2	10
1	B	206/209 (99%)	168 (82%)	31 (15%)	7 (3%)	3	12
All	All	413/418 (99%)	339 (82%)	59 (14%)	15 (4%)	2	11

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	181	ARG
1	A	182	ALA
1	B	180	THR
1	A	184	SER
1	A	192	PRO
1	B	192	PRO
1	B	184	SER
1	A	156	GLN
1	A	172	VAL
1	B	156	GLN
1	B	172	VAL
1	A	119	TYR
1	A	161	PRO
1	B	119	TYR
1	B	161	PRO

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	184/184 (100%)	151 (82%)	33 (18%)	2	6
1	B	184/184 (100%)	153 (83%)	31 (17%)	2	7
All	All	368/368 (100%)	304 (83%)	64 (17%)	2	7

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	MET
1	A	34	SER
1	A	49	SER
1	A	52	TYR
1	A	65	ASP
1	A	66	GLN
1	A	71	ARG
1	A	76	ASN

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Mol	Chain	Res	Type
1	A	78	LYS
1	A	82	SER
1	A	92	THR
1	A	95	THR
1	A	118	SER
1	A	122	VAL
1	A	127	ILE
1	A	140	PRO
1	A	141	SER
1	A	145	ILE
1	A	147	ASN
1	A	151	LEU
1	A	161	PRO
1	A	162	SER
1	A	165	THR
1	A	171	ILE
1	A	176	ASN
1	A	180	THR
1	A	181	ARG
1	A	187	SER
1	A	193	THR
1	A	205	SER
1	A	215	ARG
1	A	230	GLU
1	A	232	VAL
1	B	26	MET
1	B	34	SER
1	B	49	SER
1	B	52	TYR
1	B	65	ASP
1	B	66	GLN
1	B	71	ARG
1	B	78	LYS
1	B	82	SER
1	B	92	THR
1	B	95	THR
1	B	118	SER
1	B	122	VAL
1	B	127	ILE
1	B	140	PRO
1	B	141	SER
1	B	145	ILE

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Mol	Chain	Res	Type
1	B	147	ASN
1	B	151	LEU
1	B	161	PRO
1	B	162	SER
1	B	165	THR
1	B	171	ILE
1	B	179	SER
1	B	184	SER
1	B	193	THR
1	B	205	SER
1	B	215	ARG
1	B	230	GLU
1	B	232	VAL
1	B	233	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	43	ASN
1	A	147	ASN
1	B	43	ASN
1	B	44	ASN
1	B	147	ASN

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 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.