



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 7, 2026 – 04:25 AM UTC

PDB ID : 1AUY / pdb_00001auy
Title : TURNIP YELLOW MOSAIC VIRUS
Authors : Canady, M.A.; Larson, S.B.; Day, J.; McPherson, A.
Deposited on : 1997-09-07
Resolution : 3.00 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

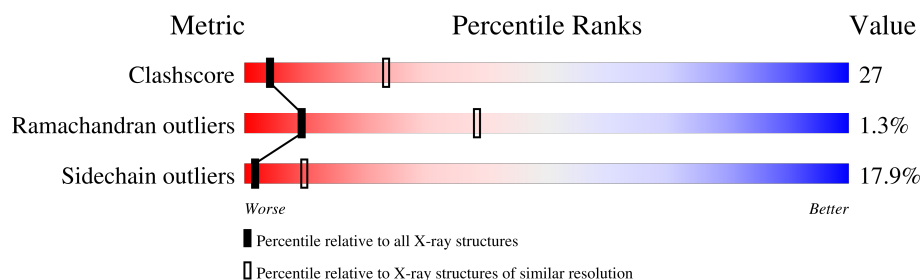
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)

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	190	
1	B	190	
1	C	190	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 4045 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 TURNIP YELLOW MOSAIC VIRUS.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	163	Total	C	N	O	S	0	0	0
			1221	784	194	236	7			
1	B	189	Total	C	N	O	S	0	0	0
			1412	905	225	274	8			
1	C	189	Total	C	N	O	S	0	0	0
			1412	905	225	274	8			

There are 12 discrepancies between the modelled and reference sequences:

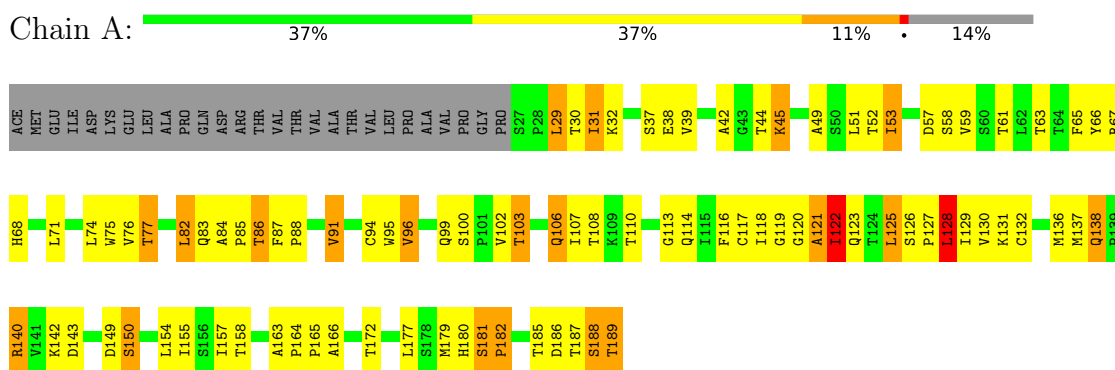
Chain	Residue	Modelled	Actual	Comment	Reference
A	0	ACE	-	acetylation	UNP P03608
A	99	GLN	ASN	variant	UNP P03608
A	123	GLN	ASN	variant	UNP P03608
A	138	GLN	ASN	variant	UNP P03608
B	0	ACE	-	acetylation	UNP P03608
B	99	GLN	ASN	variant	UNP P03608
B	123	GLN	ASN	variant	UNP P03608
B	138	GLN	ASN	variant	UNP P03608
C	0	ACE	-	acetylation	UNP P03608
C	99	GLN	ASN	variant	UNP P03608
C	123	GLN	ASN	variant	UNP P03608
C	138	GLN	ASN	variant	UNP P03608

3 Residue-property plots [i](#)

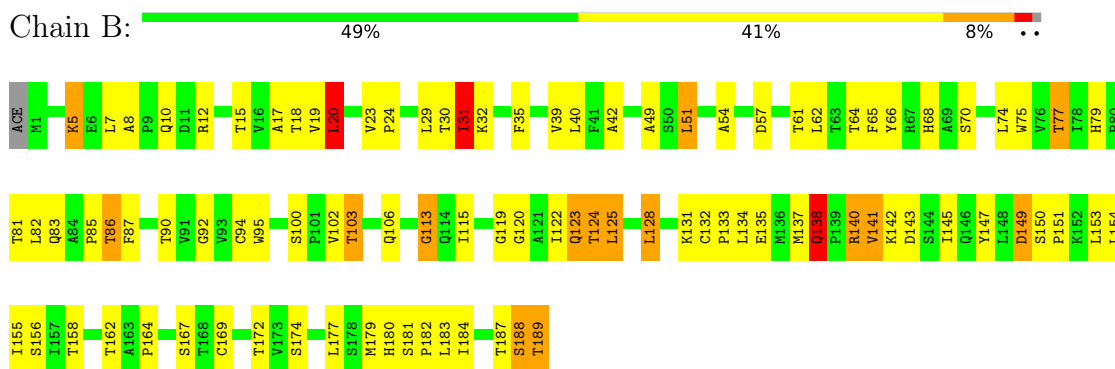
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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

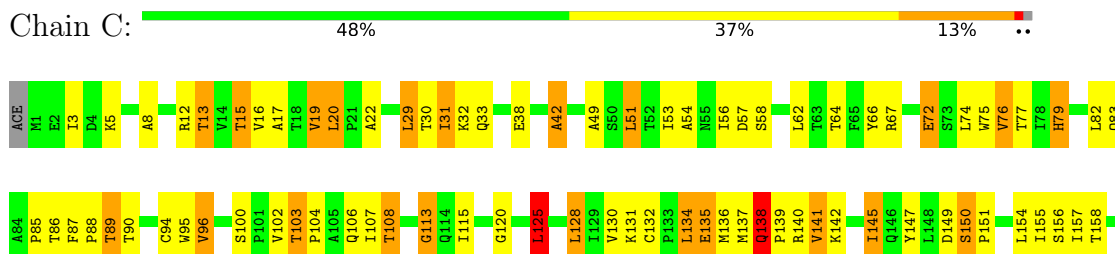
• Molecule 1: TURNIP YELLOW MOSAIC VIRUS



• Molecule 1: TURNIP YELLOW MOSAIC VIRUS



• Molecule 1: TURNIP YELLOW MOSAIC VIRUS



T162	A163	P164	S167	T168	T172	V173	L177	S178	M179	H180	S181	P182	L183	I184	T185	D186	T187	S188	T189
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

4 Data and refinement statistics

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

Property	Value	Source
Space group	P 64 2 2	Depositor
Cell constants a, b, c, α , β , γ	515.50Å 515.50Å 309.50Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	8.00 – 3.00	Depositor
% Data completeness (in resolution range)	52.0 (8.00-3.00)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.187 , 0.193	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	4045	wwPDB-VP
Average B, all atoms (Å ²)	22.0	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	0.72	0/1251	1.20	7/1719 (0.4%)
1	B	0.78	0/1446	1.28	16/1989 (0.8%)
1	C	0.82	0/1446	1.29	16/1989 (0.8%)
All	All	0.77	0/4143	1.26	39/5697 (0.7%)

There are no bond length outliers.

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	124	THR	N-CA-C	13.55	128.35	111.69
1	C	138	GLN	CA-C-N	10.18	129.94	119.56
1	C	138	GLN	C-N-CA	10.18	129.94	119.56
1	C	163	ALA	N-CA-C	9.64	120.68	109.60
1	B	8	ALA	CA-C-N	8.47	128.49	119.76
1	B	8	ALA	C-N-CA	8.47	128.49	119.76
1	B	138	GLN	CA-C-N	8.09	128.18	119.28
1	B	138	GLN	C-N-CA	8.09	128.18	119.28
1	A	128	LEU	N-CA-C	-7.97	93.81	108.24
1	C	8	ALA	CA-C-N	7.74	127.73	119.76
1	C	8	ALA	C-N-CA	7.74	127.73	119.76
1	C	125	LEU	N-CA-C	7.51	122.62	113.38
1	A	188	SER	N-CA-C	-6.50	104.19	111.28
1	C	42	ALA	N-CA-C	6.50	119.11	110.53
1	B	42	ALA	N-CA-C	6.30	119.72	110.59
1	C	51	LEU	N-CA-C	6.26	119.67	109.59
1	C	183	LEU	N-CA-C	-6.24	99.71	109.25
1	A	119	GLY	N-CA-C	-6.22	107.08	115.36
1	C	64	THR	N-CA-C	5.96	118.26	111.11
1	A	52	THR	N-CA-C	-5.90	98.90	108.41
1	A	182	PRO	N-CA-C	5.89	120.11	111.03
1	B	20	LEU	CA-C-N	5.86	125.77	119.85
1	B	20	LEU	C-N-CA	5.86	125.77	119.85
1	B	125	LEU	N-CA-C	5.80	121.63	113.56

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	20	LEU	CA-C-N	5.71	126.89	120.66
1	C	20	LEU	C-N-CA	5.71	126.89	120.66
1	A	42	ALA	N-CA-C	5.69	117.44	108.96
1	A	137	MET	N-CA-C	5.55	115.44	108.45
1	C	79	HIS	CB-CA-C	-5.48	104.74	110.33
1	B	138	GLN	N-CA-C	-5.40	96.94	108.93
1	B	31	ILE	CB-CA-C	-5.31	103.92	111.19
1	C	138	GLN	N-CA-C	-5.26	97.17	108.64
1	B	100	SER	CA-C-N	5.22	126.36	119.84
1	B	100	SER	C-N-CA	5.22	126.36	119.84
1	B	188	SER	N-CA-C	-5.20	105.04	111.33
1	B	120	GLY	N-CA-C	-5.13	101.02	113.18
1	B	149	ASP	N-CA-C	5.13	119.10	111.87
1	C	13	THR	CA-C-N	-5.11	116.48	123.12
1	C	13	THR	C-N-CA	-5.11	116.48	123.12

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	A	1221	0	1252	84	0
1	B	1412	0	1454	66	0
1	C	1412	0	1454	90	0
All	All	4045	0	4160	223	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 27.

All (223) 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:A:77:THR:HB	1:A:129:ILE:HD13	1.48	0.96
1:C:132:CYS:SG	1:C:137:MET:HE3	2.06	0.96

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:ILE:HD11	1:A:71:LEU:HD11	1.54	0.88
1:B:85:PRO:HG3	1:B:125:LEU:HD11	1.58	0.83
1:A:82:LEU:O	1:A:85:PRO:HD2	1.80	0.81
1:A:136:MET:HG2	1:B:184:ILE:HD11	1.64	0.79
1:A:102:VAL:HG21	1:A:110:THR:OG1	1.83	0.78
1:C:138:GLN:NE2	1:C:140:ARG:H	1.81	0.78
1:C:89:THR:HG21	1:C:168:THR:OG1	1.84	0.77
1:C:138:GLN:HE21	1:C:138:GLN:C	1.91	0.77
1:A:117:CYS:H	1:A:123:GLN:CD	1.93	0.76
1:A:30:THR:HG22	1:A:180:HIS:HB3	1.69	0.75
1:A:68:HIS:HE1	1:C:16:VAL:O	1.71	0.73
1:A:38:GLU:HA	1:A:172:THR:HG22	1.74	0.70
1:C:90:THR:HB	1:C:158:THR:HB	1.74	0.70
1:C:96:VAL:HG13	1:C:100:SER:HB3	1.75	0.69
1:C:87:PHE:O	1:C:89:THR:HG22	1.91	0.69
1:C:3:ILE:HG22	1:C:5:LYS:HB2	1.74	0.68
1:A:29:LEU:HD12	1:A:29:LEU:H	1.59	0.67
1:A:77:THR:HB	1:A:129:ILE:CD1	2.24	0.67
1:B:68:HIS:HD2	1:B:143:ASP:OD1	1.79	0.66
1:C:87:PHE:CG	1:C:164:PRO:HB3	2.30	0.66
1:B:87:PHE:CG	1:B:164:PRO:HB3	2.31	0.66
1:B:18:THR:HA	1:C:22:ALA:HA	1.78	0.65
1:A:31:ILE:HD12	1:A:31:ILE:H	1.62	0.65
1:B:31:ILE:HD12	1:B:31:ILE:H	1.65	0.62
1:B:79:HIS:HE1	1:B:172:THR:OG1	1.83	0.62
1:B:137:MET:HG3	1:B:151:PRO:HB3	1.80	0.62
1:A:117:CYS:H	1:A:123:GLN:NE2	1.97	0.62
1:C:104:PRO:O	1:C:107:ILE:HG12	2.00	0.62
1:A:68:HIS:HD2	1:A:143:ASP:OD1	1.81	0.61
1:A:118:ILE:HA	1:A:123:GLN:HB3	1.83	0.61
1:B:102:VAL:HG13	1:B:106:GLN:HB2	1.82	0.61
1:C:76:VAL:HG22	1:C:95:TRP:CZ2	2.36	0.61
1:A:125:LEU:HD22	1:A:126:SER:N	2.16	0.61
1:A:103:THR:H	1:A:106:GLN:HG3	1.66	0.61
1:B:19:VAL:CG2	1:B:140:ARG:HG3	2.30	0.60
1:A:117:CYS:HB3	1:A:123:GLN:OE1	2.01	0.60
1:A:122:ILE:N	1:A:122:ILE:HD12	2.17	0.60
1:C:137:MET:HG2	1:C:151:PRO:HG3	1.83	0.59
1:A:96:VAL:HG13	1:A:100:SER:HB3	1.84	0.59
1:C:76:VAL:HG23	1:C:130:VAL:HB	1.84	0.59
1:B:49:ALA:HB3	1:B:155:ILE:HB	1.83	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:123:GLN:NE2	1:B:125:LEU:H	2.00	0.59
1:A:83:GLN:O	1:A:86:THR:HG23	2.03	0.59
1:B:119:GLY:O	1:B:123:GLN:HG2	2.01	0.59
1:C:30:THR:HG22	1:C:180:HIS:HB3	1.85	0.59
1:C:49:ALA:HB3	1:C:155:ILE:HB	1.85	0.59
1:B:145:ILE:HD11	1:B:147:TYR:CE1	2.37	0.58
1:B:20:LEU:HD23	1:B:145:ILE:HD13	1.85	0.58
1:C:85:PRO:HG3	1:C:125:LEU:HD21	1.86	0.58
1:C:138:GLN:HB3	1:C:149:ASP:O	2.05	0.57
1:B:15:THR:HG22	1:C:181:SER:HB3	1.87	0.57
1:A:57:ASP:O	1:A:61:THR:HG23	2.05	0.56
1:C:188:SER:O	1:C:189:THR:HG23	2.05	0.56
1:A:68:HIS:CE1	1:C:16:VAL:O	2.57	0.56
1:A:44:THR:HA	1:A:164:PRO:HD2	1.86	0.56
1:A:87:PHE:CE2	1:A:165:PRO:HD3	2.40	0.56
1:C:96:VAL:CG1	1:C:100:SER:HB3	2.36	0.55
1:C:103:THR:HG23	1:C:106:GLN:HG3	1.87	0.55
1:C:138:GLN:HE21	1:C:140:ARG:H	1.54	0.55
1:A:102:VAL:HG13	1:A:154:LEU:HD11	1.88	0.55
1:C:145:ILE:HD11	1:C:147:TYR:CZ	2.41	0.55
1:B:19:VAL:HG21	1:B:140:ARG:HG3	1.86	0.55
1:C:135:GLU:H	1:C:135:GLU:CD	2.14	0.55
1:A:32:LYS:HA	1:A:177:LEU:O	2.06	0.55
1:B:15:THR:HG21	1:C:182:PRO:O	2.06	0.55
1:B:75:TRP:CB	1:B:131:LYS:HA	2.37	0.55
1:B:57:ASP:O	1:B:61:THR:HG23	2.06	0.55
1:C:17:ALA:CB	1:C:138:GLN:HB2	2.37	0.55
1:B:54:ALA:HA	1:B:141:VAL:HG22	1.89	0.54
1:B:20:LEU:HA	1:C:20:LEU:HD22	1.88	0.54
1:C:66:TYR:O	1:C:142:LYS:HE2	2.07	0.54
1:B:75:TRP:HB3	1:B:131:LYS:HG2	1.88	0.54
1:C:51:LEU:HD23	1:C:51:LEU:H	1.71	0.53
1:A:84:ALA:HB3	1:A:85:PRO:HD3	1.90	0.53
1:A:122:ILE:N	1:A:122:ILE:CD1	2.72	0.53
1:B:95:TRP:CE2	1:B:132:CYS:HB2	2.44	0.53
1:C:132:CYS:SG	1:C:137:MET:CE	2.88	0.53
1:B:32:LYS:HA	1:B:177:LEU:O	2.09	0.52
1:C:79:HIS:HE1	1:C:172:THR:OG1	1.92	0.52
1:A:37:SER:HB3	1:A:58:SER:OG	2.10	0.52
1:A:122:ILE:HG22	1:A:122:ILE:O	2.09	0.52
1:B:15:THR:CG2	1:C:181:SER:HB3	2.40	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:THR:HG23	1:C:181:SER:C	2.35	0.52
1:C:66:TYR:CE2	1:C:179:MET:HE3	2.45	0.52
1:A:136:MET:HG2	1:B:184:ILE:CD1	2.39	0.52
1:B:5:LYS:NZ	1:B:5:LYS:HB3	2.24	0.52
1:C:29:LEU:N	1:C:29:LEU:HD12	2.25	0.52
1:C:38:GLU:HA	1:C:172:THR:HG22	1.91	0.52
1:A:157:ILE:N	1:A:157:ILE:HD12	2.24	0.52
1:B:94:CYS:HB2	1:B:113:GLY:HA2	1.93	0.51
1:C:19:VAL:HG11	1:C:140:ARG:CZ	2.40	0.51
1:C:19:VAL:HG13	1:C:140:ARG:HG3	1.91	0.51
1:A:53:ILE:HD11	1:A:71:LEU:CD1	2.34	0.51
1:A:87:PHE:CD2	1:A:164:PRO:HB3	2.45	0.51
1:B:20:LEU:HD22	1:C:20:LEU:HD21	1.93	0.51
1:B:87:PHE:CD1	1:B:164:PRO:HB3	2.44	0.51
1:A:45:LYS:HB2	1:A:45:LYS:NZ	2.26	0.51
1:A:155:ILE:HG22	1:A:157:ILE:CD1	2.41	0.51
1:B:138:GLN:HG3	1:B:149:ASP:OD1	2.10	0.51
1:C:42:ALA:HB1	1:C:157:ILE:HG21	1.93	0.51
1:C:138:GLN:HE21	1:C:139:PRO:N	2.08	0.50
1:C:94:CYS:HB2	1:C:107:ILE:HG23	1.94	0.50
1:A:126:SER:O	1:A:128:LEU:N	2.41	0.50
1:C:54:ALA:HA	1:C:141:VAL:HG22	1.93	0.50
1:A:76:VAL:CG1	1:A:130:VAL:HB	2.41	0.50
1:C:138:GLN:HG2	1:C:149:ASP:OD1	2.11	0.50
1:A:95:TRP:CE2	1:A:132:CYS:HB2	2.46	0.50
1:A:125:LEU:HD22	1:A:126:SER:H	1.76	0.50
1:C:75:TRP:CB	1:C:131:LYS:HA	2.42	0.49
1:A:29:LEU:HD12	1:A:29:LEU:N	2.25	0.49
1:A:91:VAL:CG1	1:A:118:ILE:HG12	2.43	0.49
1:A:140:ARG:NH1	1:A:140:ARG:HG3	2.28	0.49
1:A:181:SER:HB3	1:C:15:THR:HG22	1.93	0.49
1:B:90:THR:HB	1:B:158:THR:OG1	2.11	0.49
1:C:53:ILE:HG23	1:C:56:ILE:HD12	1.95	0.49
1:C:13:THR:HG22	1:C:136:MET:CE	2.42	0.48
1:A:66:TYR:O	1:A:142:LYS:HE2	2.12	0.48
1:C:134:LEU:HD12	1:C:134:LEU:HA	1.63	0.48
1:A:181:SER:C	1:C:15:THR:HG23	2.38	0.48
1:C:42:ALA:CB	1:C:157:ILE:HG13	2.44	0.47
1:C:87:PHE:CD2	1:C:164:PRO:HB3	2.48	0.47
1:C:32:LYS:HA	1:C:177:LEU:O	2.13	0.47
1:C:32:LYS:NZ	1:C:72:GLU:HG2	2.28	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:33:GLN:HG2	1:C:62:LEU:HD22	1.96	0.47
1:B:138:GLN:NE2	1:B:147:TYR:CG	2.83	0.47
1:B:95:TRP:CD2	1:B:132:CYS:HB2	2.50	0.47
1:B:183:LEU:HD23	1:B:183:LEU:C	2.40	0.47
1:A:29:LEU:H	1:A:29:LEU:CD1	2.24	0.47
1:C:31:ILE:CD1	1:C:179:MET:HG2	2.45	0.47
1:A:181:SER:OG	1:C:16:VAL:HG22	2.15	0.47
1:A:185:THR:HG23	1:A:186:ASP:N	2.30	0.47
1:C:138:GLN:NE2	1:C:138:GLN:C	2.68	0.47
1:C:31:ILE:HD12	1:C:31:ILE:H	1.80	0.46
1:C:88:PRO:HG3	1:C:120:GLY:CA	2.46	0.46
1:C:128:LEU:HD23	1:C:128:LEU:HA	1.68	0.46
1:A:30:THR:HG22	1:A:180:HIS:CB	2.43	0.46
1:A:96:VAL:CG1	1:A:100:SER:HB3	2.46	0.46
1:B:92:GLY:HA2	1:B:115:ILE:HA	1.98	0.46
1:C:77:THR:HA	1:C:128:LEU:O	2.16	0.46
1:B:31:ILE:HD13	1:B:179:MET:HE3	1.97	0.45
1:B:75:TRP:HB3	1:B:131:LYS:HA	1.98	0.45
1:C:19:VAL:CG1	1:C:140:ARG:HG3	2.45	0.45
1:A:120:GLY:O	1:A:123:GLN:N	2.49	0.45
1:A:164:PRO:HB2	1:A:166:ALA:O	2.16	0.45
1:B:138:GLN:C	1:B:138:GLN:OE1	2.60	0.45
1:A:91:VAL:HG13	1:A:118:ILE:HG12	1.99	0.45
1:B:62:LEU:HD23	1:B:62:LEU:HA	1.77	0.45
1:B:82:LEU:N	1:B:82:LEU:HD23	2.32	0.45
1:A:118:ILE:HA	1:A:123:GLN:O	2.16	0.45
1:C:137:MET:HG2	1:C:151:PRO:CG	2.47	0.45
1:A:87:PHE:CZ	1:A:164:PRO:HA	2.52	0.44
1:A:75:TRP:CD1	1:A:129:ILE:HG23	2.53	0.44
1:C:94:CYS:HB2	1:C:113:GLY:HA2	1.99	0.44
1:C:145:ILE:C	1:C:145:ILE:HD12	2.43	0.44
1:C:51:LEU:HD23	1:C:51:LEU:N	2.33	0.44
1:A:59:VAL:O	1:A:63:THR:HG23	2.17	0.44
1:C:82:LEU:O	1:C:85:PRO:HD2	2.17	0.44
1:A:140:ARG:HG3	1:A:140:ARG:HH11	1.82	0.44
1:B:180:HIS:O	1:B:181:SER:HB2	2.17	0.44
1:A:138:GLN:O	1:A:150:SER:HA	2.17	0.44
1:B:123:GLN:HE21	1:B:125:LEU:HD23	1.83	0.44
1:C:19:VAL:CG1	1:C:140:ARG:CZ	2.96	0.43
1:C:138:GLN:O	1:C:150:SER:HA	2.18	0.43
1:B:68:HIS:HA	1:B:142:LYS:O	2.18	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:42:ALA:HB2	1:C:157:ILE:HG13	2.00	0.43
1:A:94:CYS:HB2	1:A:107:ILE:HG23	2.00	0.43
1:B:19:VAL:HG23	1:B:138:GLN:NE2	2.34	0.43
1:B:65:PHE:O	1:B:182:PRO:HA	2.19	0.43
1:C:20:LEU:O	1:C:140:ARG:NH2	2.51	0.43
1:B:12:ARG:HE	1:B:133:PRO:HB3	1.82	0.43
1:B:17:ALA:HB1	1:B:138:GLN:HG2	2.00	0.43
1:C:102:VAL:HG23	1:C:154:LEU:HD11	2.00	0.43
1:C:132:CYS:SG	1:C:134:LEU:HD13	2.58	0.43
1:A:155:ILE:HG22	1:A:157:ILE:HD12	2.00	0.43
1:A:82:LEU:HA	1:A:82:LEU:HD12	1.67	0.43
1:B:35:PHE:CD1	1:B:35:PHE:C	2.97	0.43
1:B:86:THR:HB	1:B:87:PHE:CD1	2.54	0.43
1:A:181:SER:HB3	1:C:15:THR:CG2	2.49	0.43
1:C:76:VAL:HG22	1:C:95:TRP:HZ2	1.82	0.43
1:A:71:LEU:HD23	1:A:177:LEU:HD23	2.01	0.42
1:A:75:TRP:HB3	1:A:131:LYS:HA	2.02	0.42
1:A:122:ILE:O	1:A:123:GLN:HG3	2.19	0.42
1:B:77:THR:HA	1:B:128:LEU:O	2.18	0.42
1:C:54:ALA:HA	1:C:141:VAL:CG2	2.49	0.42
1:A:163:ALA:HA	1:A:164:PRO:HD3	1.89	0.42
1:A:182:PRO:O	1:C:15:THR:HG21	2.20	0.42
1:B:51:LEU:H	1:B:51:LEU:HD22	1.85	0.42
1:B:102:VAL:HA	1:B:106:GLN:OE1	2.19	0.42
1:A:116:PHE:CD1	1:A:128:LEU:HD11	2.55	0.42
1:B:122:ILE:HD12	1:B:122:ILE:HA	1.73	0.42
1:C:183:LEU:HD13	1:C:183:LEU:C	2.45	0.42
1:C:185:THR:HG23	1:C:186:ASP:N	2.33	0.42
1:A:76:VAL:HG12	1:A:130:VAL:HB	2.02	0.42
1:C:3:ILE:CG2	1:C:5:LYS:HB2	2.44	0.42
1:A:67:ARG:NH1	1:C:149:ASP:OD2	2.52	0.41
1:B:103:THR:HG23	1:B:106:GLN:HG3	2.01	0.41
1:B:134:LEU:HD23	1:B:134:LEU:HA	1.85	0.41
1:A:65:PHE:CE1	1:A:187:THR:HG22	2.55	0.41
1:B:35:PHE:O	1:B:174:SER:HA	2.20	0.41
1:C:82:LEU:HD23	1:C:82:LEU:N	2.36	0.41
1:B:81:THR:HG23	1:B:169:CYS:HA	2.02	0.41
1:C:132:CYS:O	1:C:134:LEU:N	2.54	0.41
1:A:121:ALA:C	1:A:122:ILE:CD1	2.94	0.41
1:A:125:LEU:HD11	1:A:127:PRO:HG2	2.02	0.41
1:C:75:TRP:HB3	1:C:131:LYS:HA	2.02	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:75:TRP:CB	1:A:131:LYS:HA	2.50	0.41
1:A:179:MET:HE3	1:A:179:MET:HB2	1.91	0.41
1:C:32:LYS:HZ1	1:C:72:GLU:HG2	1.85	0.41
1:A:129:ILE:HG22	1:A:130:VAL:N	2.36	0.41
1:B:23:VAL:HG23	1:B:24:PRO:HD2	2.03	0.41
1:B:115:ILE:HG21	1:B:115:ILE:HD13	1.81	0.41
1:B:188:SER:O	1:B:189:THR:HG23	2.21	0.41
1:C:108:THR:HG23	1:C:115:ILE:HG12	2.01	0.41
1:A:49:ALA:HB3	1:A:155:ILE:HB	2.02	0.41
1:A:87:PHE:CG	1:A:164:PRO:HG3	2.56	0.41
1:A:188:SER:O	1:A:189:THR:HG23	2.20	0.41
1:B:65:PHE:CE1	1:B:187:THR:HG22	2.55	0.41
1:A:99:GLN:OE1	1:A:149:ASP:HB3	2.21	0.40
1:A:31:ILE:HD12	1:A:31:ILE:N	2.31	0.40
1:B:10:GLN:HE22	1:B:95:TRP:H	1.68	0.40
1:B:66:TYR:O	1:B:142:LYS:HE2	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	A	161/190 (85%)	144 (89%)	13 (8%)	4 (2%)	4	23
1	B	187/190 (98%)	170 (91%)	16 (9%)	1 (0%)	24	60
1	C	187/190 (98%)	170 (91%)	15 (8%)	2 (1%)	11	43
All	All	535/570 (94%)	484 (90%)	44 (8%)	7 (1%)	9	38

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	122	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	113	GLY
1	A	121	ALA
1	B	113	GLY
1	C	113	GLY
1	C	181	SER
1	A	181	SER

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	144/166 (87%)	119 (83%)	25 (17%)	2	10
1	B	166/166 (100%)	136 (82%)	30 (18%)	2	9
1	C	166/166 (100%)	136 (82%)	30 (18%)	2	9
All	All	476/498 (96%)	391 (82%)	85 (18%)	2	10

All (85) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	LEU
1	A	31	ILE
1	A	39	VAL
1	A	45	LYS
1	A	51	LEU
1	A	53	ILE
1	A	74	LEU
1	A	77	THR
1	A	82	LEU
1	A	86	THR
1	A	88	PRO
1	A	91	VAL
1	A	96	VAL
1	A	103	THR
1	A	106	GLN
1	A	108	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	114	GLN
1	A	122	ILE
1	A	125	LEU
1	A	128	LEU
1	A	138	GLN
1	A	140	ARG
1	A	150	SER
1	A	158	THR
1	A	189	THR
1	B	5	LYS
1	B	7	LEU
1	B	20	LEU
1	B	29	LEU
1	B	30	THR
1	B	31	ILE
1	B	39	VAL
1	B	40	LEU
1	B	51	LEU
1	B	64	THR
1	B	70	SER
1	B	74	LEU
1	B	77	THR
1	B	83	GLN
1	B	86	THR
1	B	103	THR
1	B	123	GLN
1	B	124	THR
1	B	128	LEU
1	B	135	GLU
1	B	138	GLN
1	B	140	ARG
1	B	141	VAL
1	B	150	SER
1	B	153	LEU
1	B	154	LEU
1	B	156	SER
1	B	162	THR
1	B	167	SER
1	B	189	THR
1	C	12	ARG
1	C	15	THR
1	C	19	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	29	LEU
1	C	31	ILE
1	C	57	ASP
1	C	58	SER
1	C	67	ARG
1	C	72	GLU
1	C	74	LEU
1	C	76	VAL
1	C	83	GLN
1	C	86	THR
1	C	89	THR
1	C	96	VAL
1	C	103	THR
1	C	108	THR
1	C	125	LEU
1	C	128	LEU
1	C	134	LEU
1	C	135	GLU
1	C	138	GLN
1	C	141	VAL
1	C	145	ILE
1	C	150	SER
1	C	156	SER
1	C	162	THR
1	C	167	SER
1	C	173	VAL
1	C	189	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	55	ASN
1	A	68	HIS
1	A	83	GLN
1	B	36	GLN
1	B	68	HIS
1	B	79	HIS
1	B	99	GLN
1	B	123	GLN
1	B	160	GLN
1	C	10	GLN
1	C	33	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	79	HIS
1	C	83	GLN
1	C	138	GLN
1	C	146	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 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.