Full wwPDB X-ray Structure Validation Report (i)

Dec 2, 2023 – 03:52 pm GMT

PDB ID	:	2V6B
Title	:	Crystal structure of lactate dehydrogenase from Deinococcus Radiodurans (apo form)
Authors	:	Coquelle, N.; Fioravanti, E.; Weik, M.; Vellieux, F.
Deposited on	:	2007-07-16
Resolution	:	2.50 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 (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

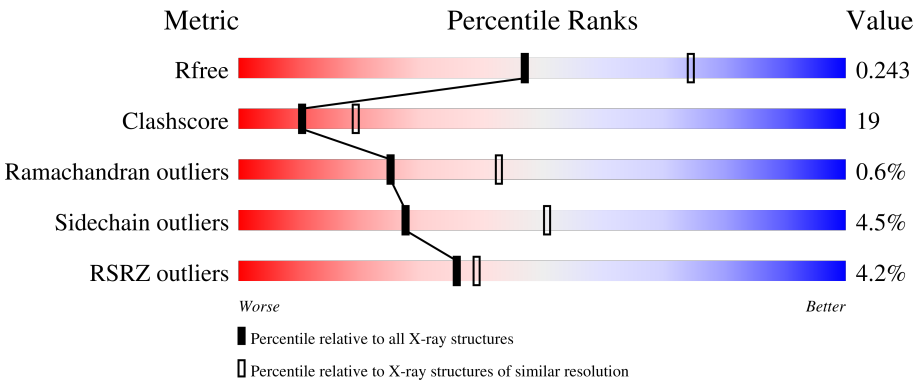
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	304	5% 59% 28% • 10%
1	B	304	3% 67% 25% • 7%
1	C	304	4% 63% 27% • 8%
1	D	304	3% 67% 23% • 8%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 8339 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 L-LACTATE DEHYDROGENASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	274	2005	1251	361	387	6	0	0	0
1	B	282	2081	1295	377	403	6	0	0	0
1	C	281	2064	1288	369	401	6	0	0	0
1	D	279	2068	1290	375	397	6	0	0	0

- Molecule 2 is water.

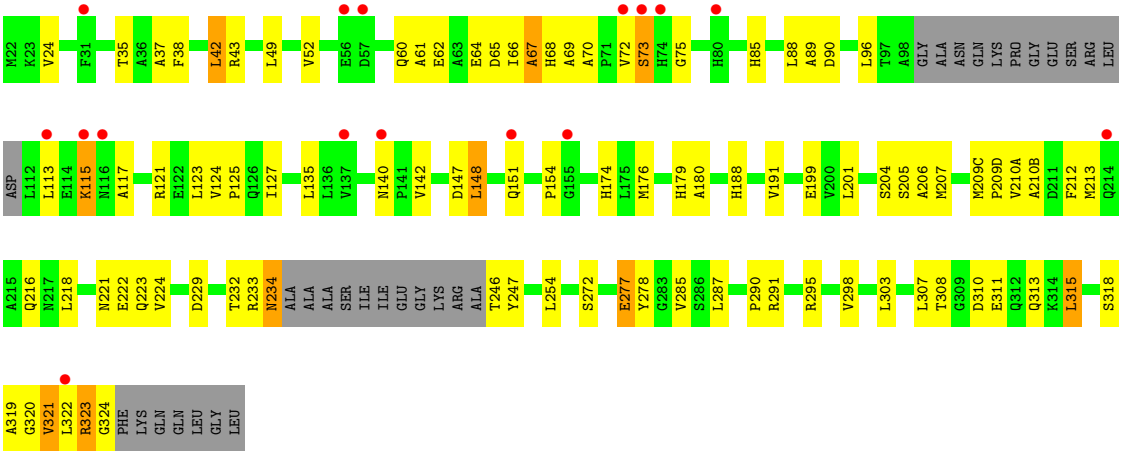
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
2	A	18	18	18	0	0
2	B	31	31	31	0	0
2	C	37	37	37	0	0
2	D	35	35	35	0	0

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

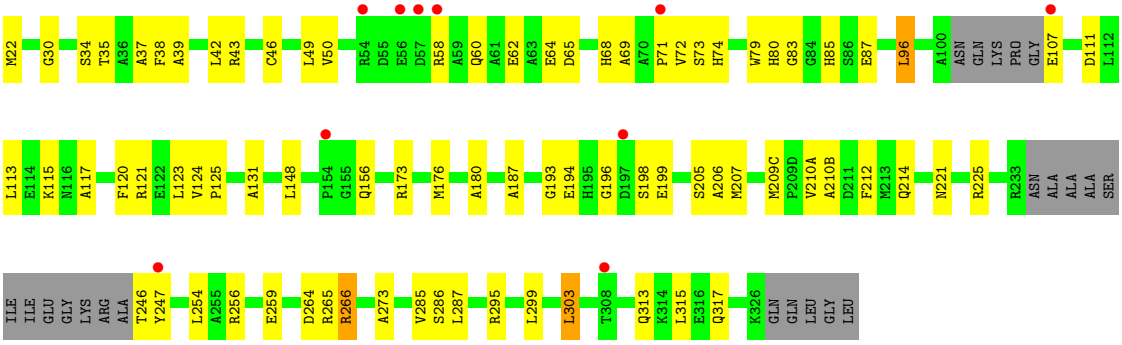
• Molecule 1: L-LACTATE DEHYDROGENASE

Chain A:



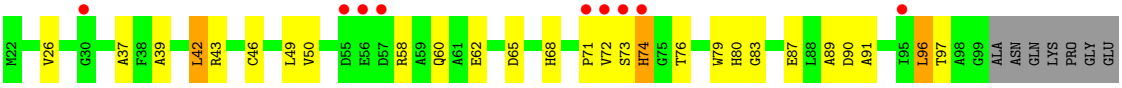
• Molecule 1: L-LACTATE DEHYDROGENASE

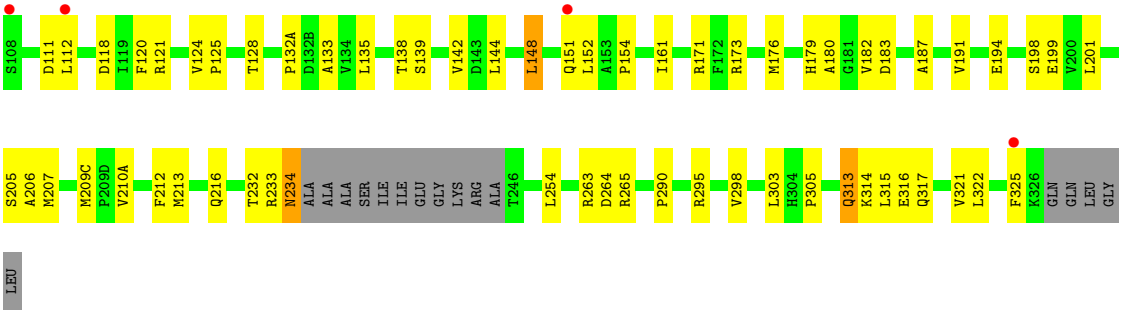
Chain B:



• Molecule 1: L-LACTATE DEHYDROGENASE

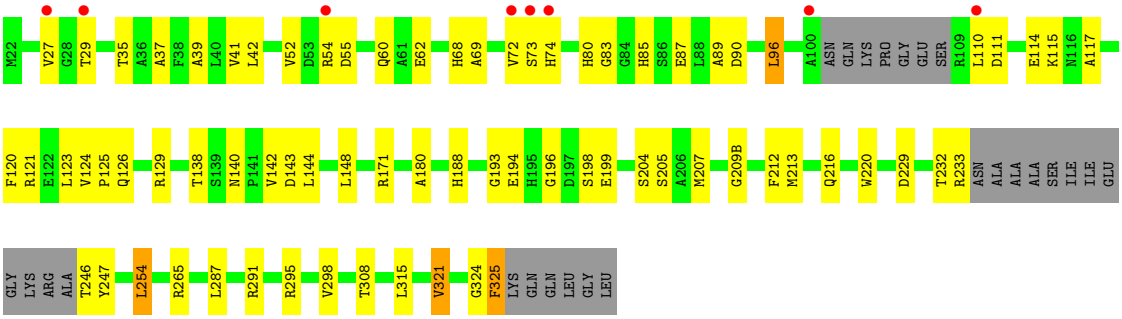
Chain C:





- Molecule 1: L-LACTATE DEHYDROGENASE

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	123.35Å 127.93Å 72.92Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.83 – 2.50 19.83 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.1 (19.83-2.50) 99.2 (19.83-2.50)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.97 (at 2.50Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.230 , 0.250 0.225 , 0.243	Depositor DCC
R_{free} test set	2012 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	50.7	Xtriage
Anisotropy	0.067	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 52.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.021 for k,h,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	8339	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.87% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	A	0.39	0/2039	0.55	0/2776
1	B	0.38	0/2115	0.57	1/2877 (0.0%)
1	C	0.39	0/2098	0.54	0/2855
1	D	0.46	0/2102	0.61	1/2860 (0.0%)
All	All	0.41	0/8354	0.57	2/11368 (0.0%)

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

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	325	PHE	CA-C-O	-11.96	94.98	120.10
1	B	69	ALA	CB-CA-C	5.42	118.23	110.10

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	67	ALA	Peptide
1	A	73	SER	Peptide

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	A	2005	0	1972	106	1
1	B	2081	0	2054	74	0
1	C	2064	0	2033	82	1
1	D	2068	0	2055	72	0
2	A	18	0	0	1	0
2	B	31	0	0	1	0
2	C	37	0	0	1	0
2	D	35	0	0	1	0
All	All	8339	0	8114	304	1

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 19.

All (304) 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:71:PRO:HG2	1:B:74:HIS:CD2	1.77	1.18
1:A:204:SER:HB3	1:A:311:GLU:OE2	1.46	1.16
1:B:71:PRO:CG	1:B:74:HIS:CD2	2.37	1.07
1:A:201:LEU:HD21	1:A:232:THR:HG21	1.36	1.04
1:A:277:GLU:HG2	1:A:278:TYR:CE1	1.97	1.00
1:D:110:LEU:CD1	1:D:325:PHE:HE1	1.75	0.98
1:B:74:HIS:HA	1:D:265:ARG:NH1	1.80	0.96
1:C:118:ASP:OD1	1:C:121:ARG:NH1	2.00	0.93
1:A:191:VAL:HG22	1:A:201:LEU:HD23	1.49	0.92
1:C:71:PRO:HB2	1:C:74:HIS:CE1	2.05	0.92
1:B:34:SER:HB3	1:B:62:GLU:OE1	1.69	0.91
1:B:71:PRO:HG2	1:B:74:HIS:HD2	1.25	0.91
1:D:110:LEU:HD12	1:D:325:PHE:HE1	1.35	0.90
1:A:42:LEU:CD1	1:A:69:ALA:HB1	2.02	0.89
1:A:277:GLU:HG2	1:A:278:TYR:CD1	2.07	0.89
1:A:213:MET:HE3	1:A:218:LEU:HB2	1.55	0.88
1:A:204:SER:CB	1:A:311:GLU:OE2	2.22	0.87
1:B:34:SER:CB	1:B:62:GLU:OE1	2.26	0.83
1:D:110:LEU:O	1:D:114:GLU:HG2	1.78	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:191:VAL:HG22	1:C:201:LEU:HD23	1.61	0.82
1:C:191:VAL:HG22	1:C:201:LEU:CD2	2.11	0.80
1:C:83:GLY:HA3	1:C:87:GLU:HG3	1.63	0.80
1:C:39:ALA:O	1:C:43:ARG:HG3	1.82	0.80
1:A:246:THR:HG23	1:B:65:ASP:OD2	1.81	0.80
1:D:205:SER:O	1:D:207:MET:HE2	1.83	0.79
1:A:62:GLU:HG2	1:B:246:THR:HG21	1.67	0.77
1:A:285:VAL:HG21	1:A:322:LEU:HD12	1.66	0.76
1:B:38:PHE:CZ	1:B:42:LEU:HD11	2.20	0.75
1:A:213:MET:HE3	1:A:218:LEU:CB	2.15	0.75
1:C:179:HIS:HD2	1:C:213:MET:CE	1.99	0.75
1:B:266:ARG:HD3	1:B:299:LEU:HD12	1.67	0.74
1:C:161:ILE:HD11	1:C:298:VAL:HG23	1.68	0.73
1:B:60:GLN:HG2	1:B:80:HIS:NE2	2.03	0.73
1:A:42:LEU:HD11	1:A:69:ALA:HB1	1.71	0.72
1:C:148:LEU:HD22	1:C:152:LEU:CD1	2.19	0.72
1:D:110:LEU:HD11	1:D:325:PHE:HE1	1.51	0.72
1:D:110:LEU:CD1	1:D:325:PHE:CE1	2.66	0.72
1:D:110:LEU:HD11	1:D:325:PHE:CE1	2.25	0.72
1:B:74:HIS:HA	1:D:265:ARG:HH12	1.52	0.71
1:D:110:LEU:HD12	1:D:325:PHE:CE1	2.24	0.71
1:B:71:PRO:CG	1:B:74:HIS:HD2	1.93	0.71
1:A:42:LEU:HD13	1:A:69:ALA:HB1	1.73	0.70
1:C:60:GLN:HG3	1:C:80:HIS:CE1	2.26	0.70
1:B:107:GLU:OE2	1:B:115:LYS:NZ	2.24	0.70
1:C:128:THR:O	1:C:132(A):PRO:HG3	1.92	0.70
1:A:66:ILE:C	1:A:68:HIS:H	1.96	0.69
1:C:201:LEU:HD21	1:C:232:THR:HG21	1.74	0.69
1:B:207:MET:HG3	1:B:209(C):MET:O	1.93	0.69
1:D:29:THR:HB	1:D:62:GLU:OE1	1.93	0.69
1:A:117:ALA:O	1:A:121:ARG:HG3	1.92	0.69
1:B:71:PRO:HG3	1:B:74:HIS:CD2	2.25	0.68
1:A:272:SER:HA	1:A:287:LEU:O	1.93	0.68
1:A:318:SER:O	1:A:322:LEU:HG	1.93	0.68
1:B:266:ARG:HD3	1:B:299:LEU:CD1	2.24	0.68
1:C:179:HIS:HD2	1:C:213:MET:HE1	1.59	0.68
1:A:179:HIS:HD2	1:A:213:MET:HE2	1.59	0.67
1:A:319:ALA:O	1:A:322:LEU:HB2	1.95	0.67
1:C:264:ASP:HB2	1:C:295:ARG:HB2	1.77	0.67
1:C:194:GLU:OE1	1:C:198:SER:HB3	1.95	0.67
1:A:277:GLU:HG3	1:A:277:GLU:O	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:74:HIS:HA	1:D:265:ARG:HH11	1.60	0.66
1:A:60:GLN:O	1:A:64:GLU:HG3	1.95	0.66
1:D:229:ASP:O	1:D:233:ARG:HG3	1.95	0.66
1:A:85:HIS:HE1	1:A:123:LEU:HD22	1.59	0.66
1:A:174:HIS:ND1	1:B:68:HIS:CE1	2.64	0.66
1:A:61:ALA:O	1:A:65:ASP:N	2.25	0.65
1:A:72:VAL:CG2	1:D:72:VAL:HG23	2.25	0.65
1:B:64:GLU:O	1:B:68:HIS:CD2	2.49	0.65
1:C:65:ASP:OD2	1:D:246:THR:HG23	1.97	0.65
1:A:277:GLU:CG	1:A:278:TYR:CE1	2.79	0.64
1:C:72:VAL:HG23	1:C:73:SER:N	2.13	0.64
1:A:308:THR:OG1	1:A:311:GLU:HG3	1.99	0.63
1:A:179:HIS:HD2	1:A:213:MET:CE	2.10	0.62
1:A:179:HIS:CD2	1:A:213:MET:HE2	2.34	0.62
1:A:188:HIS:HB3	1:A:207:MET:HB3	1.81	0.62
1:D:111:ASP:O	1:D:115:LYS:HG3	1.99	0.62
1:D:111:ASP:HA	1:D:114:GLU:CG	2.30	0.61
1:A:127:ILE:HG21	1:A:135:LEU:HD11	1.82	0.61
1:C:97:THR:HA	1:C:138:THR:HG22	1.82	0.61
1:A:72:VAL:HG21	1:D:72:VAL:HG23	1.82	0.61
1:A:320:GLY:HA2	1:A:323:ARG:HH11	1.66	0.61
1:A:310:ASP:O	1:A:313:GLN:HB3	2.01	0.61
1:B:207:MET:CE	1:C:207:MET:HG2	2.31	0.61
1:B:71:PRO:CG	1:B:74:HIS:NE2	2.64	0.60
1:C:173:ARG:HD2	1:C:187:ALA:O	2.01	0.60
1:D:180:ALA:HB1	1:D:212:PHE:CE1	2.36	0.60
1:D:42:LEU:CD2	1:D:69:ALA:O	2.49	0.60
1:B:60:GLN:HG2	1:B:80:HIS:CE1	2.37	0.60
1:A:205:SER:O	1:A:207:MET:HE2	2.02	0.59
1:C:72:VAL:HG23	1:C:73:SER:H	1.65	0.59
1:C:194:GLU:HG3	1:C:322:LEU:HD21	1.83	0.59
1:A:37:ALA:HB1	1:A:49:LEU:HD21	1.83	0.59
1:C:91:ALA:O	1:C:133:ALA:HB2	2.01	0.59
1:A:113:LEU:HD23	1:A:113:LEU:O	2.03	0.59
1:B:207:MET:HE1	1:C:207:MET:HG2	1.84	0.59
1:A:72:VAL:HG21	1:D:72:VAL:CG2	2.33	0.59
1:A:277:GLU:O	1:A:277:GLU:CG	2.51	0.59
1:A:322:LEU:O	1:A:324:GLY:N	2.35	0.59
1:A:179:HIS:CD2	1:A:213:MET:CE	2.87	0.58
1:C:50:VAL:HG22	1:C:79:TRP:CZ2	2.38	0.58
1:C:118:ASP:HA	1:C:121:ARG:NH1	2.19	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:42:LEU:HD21	1:D:69:ALA:O	2.04	0.57
1:A:66:ILE:O	1:A:68:HIS:N	2.38	0.57
1:C:71:PRO:O	1:C:74:HIS:O	2.21	0.57
1:A:320:GLY:CA	1:A:323:ARG:HH11	2.18	0.57
1:C:148:LEU:HD22	1:C:152:LEU:HD11	1.86	0.57
1:C:71:PRO:CB	1:C:74:HIS:CE1	2.86	0.57
1:A:320:GLY:HA2	1:A:323:ARG:CD	2.34	0.56
1:A:191:VAL:HG22	1:A:201:LEU:CD2	2.28	0.56
1:A:320:GLY:C	1:A:322:LEU:H	2.08	0.56
1:B:72:VAL:CG2	1:C:72:VAL:CG2	2.84	0.56
1:C:151:GLN:O	1:C:154:PRO:HD3	2.06	0.56
1:A:246:THR:CG2	1:B:65:ASP:OD2	2.54	0.56
1:B:193:GLY:HA2	1:B:287:LEU:HD22	1.88	0.56
1:B:34:SER:HB2	1:B:62:GLU:OE1	2.06	0.56
1:B:180:ALA:HB1	1:B:212:PHE:CE2	2.41	0.56
1:B:38:PHE:CE2	1:B:42:LEU:HD11	2.41	0.55
1:C:180:ALA:HB1	1:C:212:PHE:CE1	2.41	0.55
1:D:199:GLU:O	1:D:233:ARG:NH2	2.40	0.55
1:C:179:HIS:HD2	1:C:213:MET:HE2	1.70	0.55
1:B:196:GLY:O	1:B:199:GLU:HG2	2.06	0.55
1:A:72:VAL:HG23	1:A:73:SER:N	2.21	0.55
1:A:89:ALA:O	1:A:90:ASP:HB2	2.06	0.54
1:B:60:GLN:HG2	1:B:80:HIS:CD2	2.42	0.54
1:A:61:ALA:O	1:A:64:GLU:N	2.40	0.54
1:B:43:ARG:HH12	1:B:256:ARG:HG3	1.72	0.54
1:B:83:GLY:HA3	1:B:87:GLU:HG3	1.89	0.54
1:C:205:SER:HB3	2:C:1036:HOH:O	2.07	0.54
1:C:233:ARG:O	1:C:234:ASN:C	2.45	0.54
1:D:37:ALA:O	1:D:41:VAL:HG23	2.07	0.54
1:D:138:THR:HG21	1:D:254:LEU:HD21	1.89	0.54
1:A:307:LEU:HB3	1:A:311:GLU:HB2	1.89	0.54
1:B:72:VAL:HG23	1:B:73:SER:H	1.73	0.54
1:B:72:VAL:CG2	1:C:72:VAL:HG23	2.38	0.53
1:B:72:VAL:HG23	1:B:73:SER:N	2.24	0.53
1:A:75:GLY:HA3	1:C:265:ARG:NH1	2.23	0.53
1:C:89:ALA:O	1:C:90:ASP:HB2	2.07	0.53
1:D:144:LEU:HD11	1:D:325:PHE:HB2	1.91	0.53
1:A:320:GLY:C	1:A:322:LEU:N	2.60	0.53
1:A:320:GLY:HA2	1:A:323:ARG:HD3	1.90	0.53
1:A:85:HIS:CE1	1:A:123:LEU:HD22	2.41	0.52
1:C:37:ALA:HB1	1:C:49:LEU:HD21	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:74:HIS:O	1:C:74:HIS:ND1	2.39	0.52
1:B:72:VAL:HG23	1:C:72:VAL:HG23	1.92	0.52
1:B:71:PRO:HG3	1:B:74:HIS:NE2	2.25	0.52
1:B:74:HIS:CA	1:D:265:ARG:NH1	2.64	0.52
1:B:111:ASP:O	1:B:115:LYS:HG3	2.10	0.52
1:B:303:LEU:HD21	1:C:216:GLN:NE2	2.24	0.52
1:A:68:HIS:C	1:A:70:ALA:H	2.12	0.52
1:D:193:GLY:HA2	1:D:287:LEU:HD22	1.90	0.52
1:A:66:ILE:C	1:A:68:HIS:N	2.57	0.52
1:A:287:LEU:HD21	1:A:315:LEU:HD21	1.93	0.51
1:B:264:ASP:O	1:B:264:ASP:CG	2.46	0.51
1:D:83:GLY:HA3	1:D:87:GLU:HG3	1.92	0.51
1:D:188:HIS:HB3	1:D:207:MET:HB3	1.92	0.51
1:A:285:VAL:HG21	1:A:322:LEU:CD1	2.38	0.51
1:C:71:PRO:HB2	1:C:74:HIS:HE1	1.68	0.51
1:A:72:VAL:CG2	1:D:72:VAL:CG2	2.88	0.51
1:B:210(A):VAL:HG13	1:B:210(B):ALA:N	2.26	0.51
1:A:221:ASN:O	1:A:223:GLN:N	2.43	0.51
1:C:46:CYS:O	1:C:76:THR:OG1	2.29	0.50
1:C:290:PRO:HG2	1:C:303:LEU:O	2.11	0.50
1:D:96:LEU:HD13	1:D:120:PHE:CZ	2.47	0.50
1:D:194:GLU:OE1	1:D:198:SER:HB3	2.10	0.50
1:C:179:HIS:CD2	1:C:213:MET:HE2	2.46	0.50
1:A:201:LEU:CD2	1:A:232:THR:HG21	2.25	0.50
1:C:179:HIS:CD2	1:C:213:MET:CE	2.88	0.50
1:C:58:ARG:O	1:C:62:GLU:HG2	2.13	0.49
1:A:321:VAL:HG12	1:A:321:VAL:O	2.12	0.49
1:A:113:LEU:HD23	1:A:113:LEU:C	2.33	0.49
1:C:148:LEU:CD2	1:C:152:LEU:HD11	2.42	0.49
1:A:207:MET:HA	1:A:209(C):MET:O	2.12	0.49
1:C:176:MET:SD	1:C:206:ALA:HB1	2.53	0.48
1:D:35:THR:HG21	1:D:247:TYR:O	2.14	0.48
1:C:148:LEU:HD22	1:C:152:LEU:HD12	1.96	0.48
1:D:111:ASP:HA	1:D:114:GLU:HG2	1.95	0.48
1:C:50:VAL:HG22	1:C:79:TRP:CH2	2.49	0.48
1:A:124:VAL:N	1:A:125:PRO:HD2	2.29	0.47
1:D:321:VAL:O	1:D:324:GLY:N	2.46	0.47
1:A:188:HIS:CE1	1:D:209(B):GLY:HA3	2.49	0.47
1:D:144:LEU:CD1	1:D:325:PHE:CB	2.92	0.47
1:B:117:ALA:O	1:B:121:ARG:HG3	2.14	0.47
1:C:71:PRO:CB	1:C:74:HIS:HE1	2.24	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:75:GLY:O	1:C:263:ARG:NH1	2.46	0.47
1:A:199:GLU:O	1:A:233:ARG:NH1	2.47	0.47
1:A:287:LEU:HD21	1:A:315:LEU:CD2	2.45	0.47
1:B:107:GLU:OE2	1:B:115:LYS:CE	2.63	0.47
1:B:124:VAL:N	1:B:125:PRO:HD2	2.29	0.47
1:C:72:VAL:C	1:C:74:HIS:H	2.18	0.47
1:B:22:MET:O	1:B:46:CYS:HB2	2.15	0.47
1:A:322:LEU:C	1:A:324:GLY:N	2.68	0.47
1:B:72:VAL:HG21	1:C:72:VAL:CG2	2.45	0.47
1:C:96:LEU:HD13	1:C:120:PHE:CZ	2.50	0.46
1:A:42:LEU:HD13	1:A:69:ALA:CB	2.44	0.46
1:D:110:LEU:HD12	1:D:110:LEU:N	2.30	0.46
1:C:68:HIS:CE1	1:D:171:ARG:HG2	2.50	0.46
1:D:85:HIS:HE1	1:D:123:LEU:HD22	1.79	0.46
1:D:144:LEU:CD1	1:D:325:PHE:HB2	2.45	0.46
1:A:35:THR:HG21	1:A:247:TYR:O	2.15	0.46
1:A:38:PHE:HE1	1:A:69:ALA:HB2	1.79	0.46
1:A:42:LEU:HD12	1:A:69:ALA:O	2.14	0.46
1:A:43:ARG:HG2	1:A:43:ARG:HH21	1.81	0.46
1:B:173:ARG:HD2	1:B:187:ALA:O	2.15	0.46
1:C:72:VAL:C	1:C:74:HIS:N	2.69	0.46
1:C:210(A):VAL:O	1:C:213:MET:HG2	2.16	0.46
1:A:201:LEU:HD11	1:A:229:ASP:HA	1.97	0.45
1:B:131:ALA:O	1:B:156:GLN:NE2	2.49	0.45
1:C:71:PRO:HG2	1:C:74:HIS:HE1	1.81	0.45
1:A:221:ASN:OD1	1:A:223:GLN:HB2	2.16	0.45
1:C:42:LEU:HD21	1:D:39:ALA:HA	1.97	0.45
1:D:229:ASP:OD1	1:D:229:ASP:C	2.54	0.45
1:A:176:MET:SD	1:A:206:ALA:HB1	2.56	0.45
1:D:27:VAL:HG22	1:D:52:VAL:HB	1.97	0.45
1:D:287:LEU:HD23	1:D:287:LEU:HA	1.71	0.45
1:B:113:LEU:O	1:B:113:LEU:HD12	2.16	0.45
1:C:139:SER:O	1:C:142:VAL:HA	2.17	0.45
1:A:24:VAL:O	1:A:49:LEU:HA	2.17	0.45
1:B:313:GLN:O	1:B:317:GLN:HG3	2.17	0.45
1:D:229:ASP:O	1:D:229:ASP:OD1	2.35	0.45
1:D:194:GLU:O	1:D:199:GLU:HB3	2.17	0.45
1:B:39:ALA:O	1:B:43:ARG:HB2	2.16	0.44
1:A:320:GLY:HA2	1:A:323:ARG:HD2	1.99	0.44
1:D:72:VAL:HG22	2:D:1001:HOH:O	2.16	0.44
1:B:273:ALA:O	1:B:286:SER:HA	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:72:VAL:O	1:C:74:HIS:N	2.50	0.44
1:D:144:LEU:HD22	1:D:325:PHE:O	2.17	0.44
1:D:144:LEU:HD11	1:D:325:PHE:CB	2.47	0.44
1:A:246:THR:CG2	1:A:246:THR:O	2.65	0.44
1:D:124:VAL:N	1:D:125:PRO:HD2	2.32	0.44
1:A:72:VAL:HG23	1:D:72:VAL:HG23	1.98	0.44
1:A:151:GLN:O	1:A:154:PRO:HD3	2.18	0.44
1:B:107:GLU:OE2	1:B:115:LYS:HE3	2.17	0.44
1:D:144:LEU:HD13	1:D:325:PHE:HB3	1.98	0.44
1:A:209(D):PRO:O	1:A:210(A):VAL:C	2.55	0.44
1:A:307:LEU:HB3	1:A:311:GLU:CB	2.48	0.44
1:A:320:GLY:O	1:A:322:LEU:N	2.51	0.44
1:B:85:HIS:HE1	1:B:123:LEU:HD22	1.83	0.44
1:A:229:ASP:OD1	1:A:233:ARG:HD2	2.18	0.43
1:B:194:GLU:O	1:B:199:GLU:HB3	2.18	0.43
1:D:126:GLN:O	1:D:129:ARG:HB3	2.17	0.43
1:D:171:ARG:NH1	1:D:232:THR:O	2.51	0.43
1:A:291:ARG:HB3	1:A:298:VAL:HG13	1.99	0.43
1:A:213:MET:HE3	1:A:218:LEU:HB3	1.97	0.43
1:B:303:LEU:CD2	1:C:216:GLN:CD	2.86	0.43
1:A:210(A):VAL:HG13	1:A:210(B):ALA:N	2.34	0.43
1:A:290:PRO:HG2	1:A:303:LEU:O	2.17	0.43
1:B:50:VAL:HG22	1:B:79:TRP:CZ2	2.53	0.43
1:B:266:ARG:CD	1:B:299:LEU:CD1	2.96	0.43
1:A:42:LEU:HD12	1:A:42:LEU:HA	1.80	0.43
1:D:42:LEU:HA	1:D:42:LEU:HD23	1.67	0.43
1:B:193:GLY:C	1:B:287:LEU:HD22	2.39	0.43
1:A:180:ALA:HB1	1:A:212:PHE:CE1	2.54	0.43
1:C:148:LEU:CD2	1:C:152:LEU:CD1	2.95	0.43
1:D:42:LEU:HD23	1:D:69:ALA:O	2.17	0.43
1:A:68:HIS:C	1:A:70:ALA:N	2.71	0.43
1:A:179:HIS:CD2	1:A:213:MET:HE1	2.54	0.43
1:B:287:LEU:HD23	1:B:287:LEU:HA	1.81	0.43
1:C:124:VAL:N	1:C:125:PRO:HD2	2.34	0.43
1:A:246:THR:HG23	1:A:246:THR:O	2.18	0.43
1:B:35:THR:HG21	1:B:247:TYR:O	2.18	0.43
1:B:303:LEU:HD23	1:C:216:GLN:OE1	2.18	0.43
1:D:229:ASP:OD1	1:D:233:ARG:HD2	2.19	0.43
1:A:212:PHE:CE1	1:A:216:GLN:HG3	2.54	0.42
1:C:313:GLN:O	1:C:317:GLN:HG3	2.19	0.42
1:D:193:GLY:C	1:D:287:LEU:HD22	2.40	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:144:LEU:HD11	1:C:325:PHE:HB2	2.00	0.42
1:A:233:ARG:O	1:A:234:ASN:C	2.57	0.42
1:D:216:GLN:HA	1:D:216:GLN:NE2	2.35	0.42
1:C:60:GLN:CG	1:C:80:HIS:CE1	2.99	0.42
1:C:171:ARG:HD3	1:D:68:HIS:NE2	2.35	0.42
1:C:182:VAL:CG1	1:C:183:ASP:N	2.83	0.42
1:A:52:VAL:HG21	1:A:88:LEU:HD21	2.01	0.42
1:C:161:ILE:CD1	1:C:298:VAL:HG23	2.45	0.42
1:A:148:LEU:O	1:A:151:GLN:HB2	2.19	0.41
1:C:194:GLU:O	1:C:199:GLU:HB3	2.20	0.41
1:D:60:GLN:HG3	1:D:80:HIS:CE1	2.55	0.41
1:D:142:VAL:HG13	1:D:143:ASP:N	2.35	0.41
1:D:291:ARG:HB3	1:D:298:VAL:HG13	2.01	0.41
1:B:43:ARG:HD3	1:B:259:GLU:OE2	2.20	0.41
1:B:205:SER:HB3	2:B:1030:HOH:O	2.20	0.41
1:D:204:SER:CB	1:D:308:THR:HG23	2.50	0.41
1:C:207:MET:HA	1:C:209(C):MET:O	2.20	0.41
1:A:140:ASN:HA	1:A:142:VAL:N	2.35	0.41
1:B:221:ASN:O	1:B:225:ARG:HG3	2.20	0.41
1:C:42:LEU:HD12	1:C:42:LEU:HA	1.88	0.41
1:C:317:GLN:O	1:C:321:VAL:HG23	2.20	0.41
1:D:196:GLY:O	1:D:199:GLU:HG2	2.21	0.41
1:D:213:MET:HE3	1:D:220:TRP:CZ3	2.56	0.41
1:B:96:LEU:HD13	1:B:120:PHE:CZ	2.55	0.41
1:B:176:MET:SD	1:B:206:ALA:HB1	2.60	0.41
1:D:89:ALA:O	1:D:90:ASP:HB2	2.21	0.41
1:D:110:LEU:CD1	1:D:110:LEU:N	2.84	0.41
1:A:319:ALA:HA	1:A:322:LEU:HD12	2.03	0.41
1:B:37:ALA:HB1	1:B:49:LEU:HD21	2.03	0.41
1:C:97:THR:HG22	1:C:138:THR:HG21	2.03	0.40
1:B:285:VAL:HG23	1:B:287:LEU:HG	2.04	0.40
1:C:111:ASP:O	1:C:112:LEU:C	2.59	0.40
1:C:303:LEU:O	1:C:305:PRO:HD3	2.22	0.40
1:A:221:ASN:O	1:A:224:VAL:N	2.54	0.40
1:B:72:VAL:HG23	1:C:72:VAL:CG2	2.50	0.40
1:B:194:GLU:CD	1:B:198:SER:HG	2.24	0.40
1:D:117:ALA:O	1:D:121:ARG:HG3	2.22	0.40
1:A:174:HIS:HB2	2:A:1004:HOH:O	2.21	0.40
1:D:54:ARG:HG3	1:D:55:ASP:N	2.37	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:115:LYS:NZ	1:C:316:GLU:OE2[4_455]	2.13	0.07

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	268/304 (88%)	253 (94%)	11 (4%)	4 (2%)	10	18
1	B	276/304 (91%)	264 (96%)	11 (4%)	1 (0%)	34	54
1	C	275/304 (90%)	268 (98%)	7 (2%)	0	100	100
1	D	273/304 (90%)	265 (97%)	6 (2%)	2 (1%)	22	39
All	All	1092/1216 (90%)	1050 (96%)	35 (3%)	7 (1%)	25	43

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	222	GLU
1	A	323	ARG
1	B	30	GLY
1	D	73	SER
1	A	67	ALA
1	D	321	VAL
1	A	321	VAL

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	A	206/234 (88%)	196 (95%)	10 (5%)	25	47
1	B	215/234 (92%)	205 (95%)	10 (5%)	26	49
1	C	213/234 (91%)	202 (95%)	11 (5%)	23	44
1	D	214/234 (92%)	207 (97%)	7 (3%)	38	64
All	All	848/936 (91%)	810 (96%)	38 (4%)	27	51

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	LEU
1	A	96	LEU
1	A	115	LYS
1	A	147	ASP
1	A	148	LEU
1	A	234	ASN
1	A	254	LEU
1	A	277	GLU
1	A	295	ARG
1	A	315	LEU
1	B	58	ARG
1	B	96	LEU
1	B	148	LEU
1	B	214	GLN
1	B	254	LEU
1	B	265	ARG
1	B	266	ARG
1	B	295	ARG
1	B	303	LEU
1	B	315	LEU
1	C	26	VAL
1	C	42	LEU
1	C	74	HIS
1	C	96	LEU
1	C	135	LEU
1	C	148	LEU
1	C	234	ASN
1	C	254	LEU
1	C	313	GLN
1	C	314	LYS
1	C	315	LEU
1	D	74	HIS
1	D	96	LEU

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Mol	Chain	Res	Type
1	D	140	ASN
1	D	148	LEU
1	D	254	LEU
1	D	295	ARG
1	D	315	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	68	HIS
1	A	85	HIS
1	A	179	HIS
1	A	312	GLN
1	B	68	HIS
1	B	74	HIS
1	B	85	HIS
1	B	126	GLN
1	B	312	GLN
1	C	179	HIS
1	C	317	GLN
1	D	85	HIS
1	D	216	GLN
1	D	296	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	274/304 (90%)	0.21	16 (5%)	23	24	29, 54, 84, 97	9 (3%)
1	B	282/304 (92%)	-0.02	10 (3%)	44	47	25, 48, 76, 90	8 (2%)
1	C	281/304 (92%)	0.10	13 (4%)	32	34	22, 45, 73, 86	10 (3%)
1	D	279/304 (91%)	0.04	8 (2%)	51	55	24, 47, 74, 86	6 (2%)
All	All	1116/1216 (91%)	0.08	47 (4%)	36	39	22, 48, 78, 97	33 (2%)

All (47) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	72	VAL	5.2
1	A	31	PHE	4.9
1	C	73	SER	4.8
1	C	112	LEU	4.2
1	D	73	SER	4.1
1	A	57	ASP	3.9
1	A	73	SER	3.6
1	A	74	HIS	3.6
1	B	247	TYR	3.5
1	C	74	HIS	3.4
1	B	107	GLU	3.2
1	D	110	LEU	3.2
1	B	56	GLU	3.1
1	C	57	ASP	3.0
1	C	56	GLU	3.0
1	B	54	ARG	3.0
1	A	214	GLN	2.9
1	A	155	GLY	2.8
1	A	151	GLN	2.6
1	C	151	GLN	2.6
1	A	115	LYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	71	PRO	2.5
1	D	100	ALA	2.5
1	A	140	ASN	2.4
1	D	29	THR	2.4
1	A	113	LEU	2.4
1	A	56	GLU	2.3
1	D	54	ARG	2.3
1	C	108	SER	2.3
1	B	57	ASP	2.3
1	A	322	LEU	2.3
1	B	58	ARG	2.2
1	C	71	PRO	2.2
1	A	72	VAL	2.2
1	C	325	PHE	2.2
1	B	308	THR	2.2
1	C	95	ILE	2.2
1	C	55	ASP	2.1
1	A	80	HIS	2.1
1	B	197	ASP	2.1
1	D	74	HIS	2.1
1	A	116	ASN	2.1
1	C	30	GLY	2.1
1	D	72	VAL	2.0
1	B	154	PRO	2.0
1	A	137	VAL	2.0
1	D	27	VAL	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.