



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 4, 2026 – 11:56 PM UTC

PDB ID : 3PV2 / pdb_00003pv2
Title : Structure of Legionella fallonii DegQ (wt)
Authors : Wrase, R.; Scott, H.; Hilgenfeld, R.; Hansen, G.
Deposited on : 2010-12-06
Resolution : 2.15 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
Xtrriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

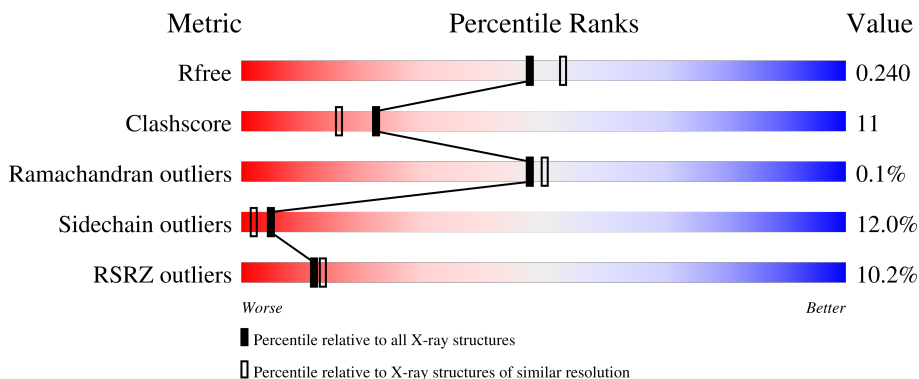
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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}	180053	2057 (2.16-2.16)
Clashscore	190562	2159 (2.16-2.16)
Ramachandran outliers	187476	2134 (2.16-2.16)
Sidechain outliers	187428	2133 (2.16-2.16)
RSRZ outliers	180081	2059 (2.16-2.16)

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 $\leq 5\%$. 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	451	 6% 65% 15% 5% 15%
1	B	451	 6% 69% 14% • 14%
1	C	451	 16% 63% 19% • 14%
1	D	451	 7% 63% 17% 5% 15%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 12098 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.

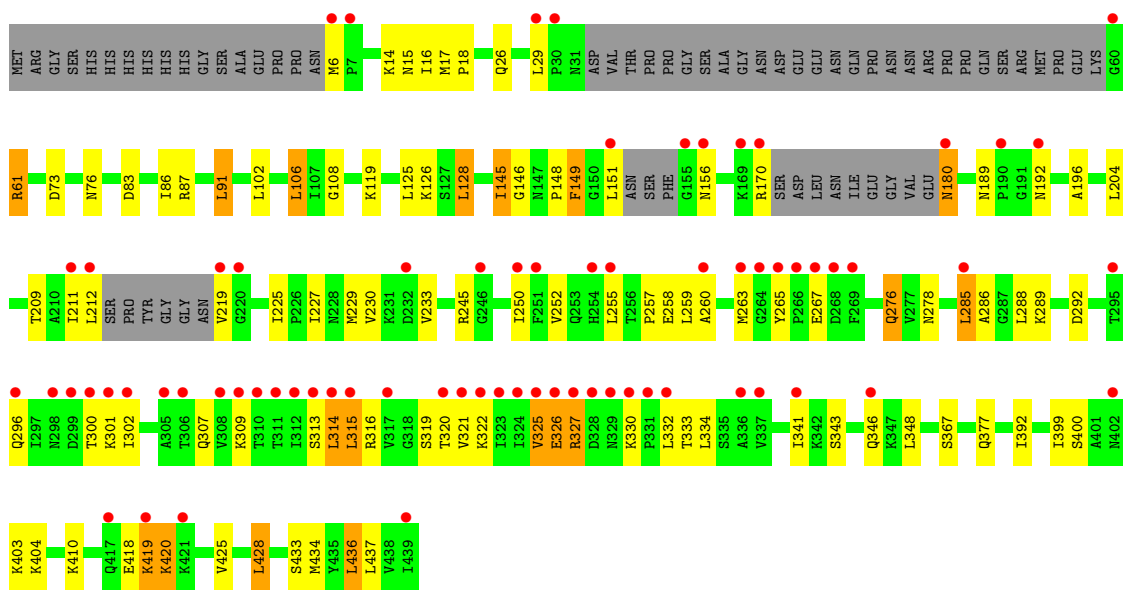
- Molecule 1 is a protein called DegQ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	384	Total 2895	C 1838	N 504	O 546	S 7	0	4	0
1	B	388	Total 2925	C 1856	N 509	O 554	S 6	0	4	0
1	C	388	Total 2922	C 1852	N 512	O 551	S 7	0	4	0
1	D	383	Total 2888	C 1833	N 502	O 546	S 7	0	4	0

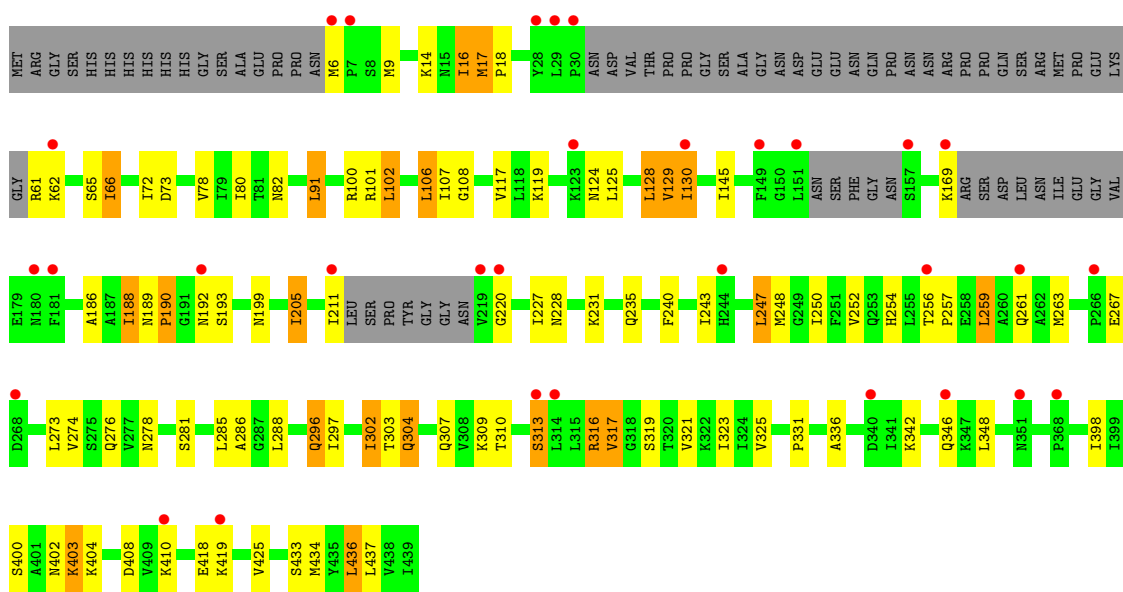
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	123	Total 123	O 123	0	0
2	B	128	Total 128	O 128	0	0
2	C	105	Total 105	O 105	0	0
2	D	112	Total 112	O 112	0	0

• Molecule 1: DegQ



• Molecule 1: DegQ



4 Data and refinement statistics i

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	136.70Å 136.70Å 327.00Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	36.93 – 2.15 36.93 – 2.15	Depositor EDS
% Data completeness (in resolution range)	98.1 (36.93-2.15) 98.0 (36.93-2.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.04	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.87 (at 2.16Å)	Xtrriage
Refinement program	REFMAC 5.5.0110	Depositor
R, R_{free}	0.211 , 0.251 0.202 , 0.240	Depositor DCC
R_{free} test set	6107 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å ²)	36.7	Xtrriage
Anisotropy	0.575	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 51.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.004 for -h,1/3*h-1/3*k-1/3*l,-4/3*h-8/3*k +1/3*l 0.005 for -1/3*h+1/3*k+1/3*l,-k,8/3*h+4/ 3*k+1/3*l 0.007 for -2/3*h-1/3*k-1/3*l,-1/3*h-2/3*k+ 1/3*l,-4/3*h+4/3*k+1/3*l 0.003 for 1/3*h+2/3*k-1/3*l,-k,-8/3*h-4/3* k-1/3*l 0.004 for -1/3*h-2/3*k+1/3*l,-2/3*h-1/3*k- 1/3*l,4/3*h-4/3*k-1/3*l 0.002 for -h,2/3*h+1/3*k+1/3*l,4/3*h+8/3 *k-1/3*l 0.018 for h,-h-k,-l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12098	wwPDB-VP
Average B, all atoms (Å ²)	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.00% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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	1.34	9/2932 (0.3%)	1.19	11/3971 (0.3%)
1	B	1.29	7/2964 (0.2%)	1.16	5/4015 (0.1%)
1	C	1.22	4/2959 (0.1%)	1.11	4/4006 (0.1%)
1	D	1.24	4/2925 (0.1%)	1.14	6/3961 (0.2%)
All	All	1.27	24/11780 (0.2%)	1.15	26/15953 (0.2%)

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	425	VAL	CA-C	-8.18	1.42	1.52
1	A	373	VAL	CA-CB	-6.98	1.46	1.54
1	B	406	VAL	CA-C	-6.97	1.44	1.52
1	A	17	MET	C-O	-6.80	1.18	1.24
1	A	392	ILE	CA-CB	-6.71	1.46	1.54
1	A	238	ILE	CA-C	6.14	1.60	1.52
1	A	406	VAL	CA-C	-5.95	1.45	1.52
1	A	393	ARG	C-O	5.86	1.29	1.24
1	C	196	ALA	C-O	-5.85	1.17	1.23
1	D	323	ILE	CA-C	-5.65	1.45	1.52
1	B	276	GLN	C-O	-5.52	1.17	1.23
1	B	419	LYS	N-CA	5.36	1.52	1.45
1	D	317	VAL	CA-CB	5.35	1.59	1.54
1	B	211	ILE	CA-CB	5.29	1.61	1.54
1	C	377	GLN	C-O	-5.28	1.17	1.24
1	B	372	ASN	CA-C	5.27	1.59	1.52
1	B	302	ILE	CG1-CD1	-5.23	1.31	1.51
1	D	250	ILE	CA-CB	-5.22	1.46	1.54
1	A	310	THR	CA-CB	5.18	1.61	1.53
1	C	425	VAL	C-O	5.18	1.29	1.24
1	D	274	VAL	C-O	-5.17	1.18	1.24
1	A	10	ALA	CA-CB	5.15	1.60	1.53
1	A	234	ALA	C-O	-5.12	1.18	1.24
1	B	160	ALA	C-O	-5.01	1.17	1.23

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	151	LEU	N-CA-C	7.64	119.61	111.28
1	D	259	LEU	N-CA-C	-7.27	102.74	111.69
1	A	145	ILE	CB-CA-C	-6.73	100.13	110.50
1	D	256	THR	CA-C-N	6.46	125.96	119.24
1	D	256	THR	C-N-CA	6.46	125.96	119.24
1	B	221	ILE	CB-CA-C	-6.12	102.52	110.84
1	B	17	MET	CA-C-N	-6.01	113.93	119.82
1	B	17	MET	C-N-CA	-6.01	113.93	119.82
1	A	15	ASN	N-CA-C	5.87	118.45	111.71
1	D	145	ILE	CB-CA-C	-5.65	101.80	110.50
1	A	20	ILE	CB-CA-C	-5.60	103.22	110.84
1	A	311	THR	N-CA-C	5.53	117.31	111.28
1	C	145	ILE	CB-CA-C	-5.50	102.42	110.62
1	C	327	ARG	CB-CA-C	-5.47	102.03	110.78
1	A	425	VAL	CB-CA-C	5.43	118.67	110.63
1	A	86	ILE	N-CA-C	5.32	118.09	112.83
1	D	281	SER	CA-C-N	-5.25	113.50	119.28
1	D	281	SER	C-N-CA	-5.25	113.50	119.28
1	A	404	LYS	CA-C-N	-5.23	114.57	119.85
1	A	404	LYS	C-N-CA	-5.23	114.57	119.85
1	B	145	ILE	CB-CA-C	-5.14	103.02	110.63
1	A	66	ILE	N-CA-C	5.14	115.88	108.48
1	A	250	ILE	N-CA-C	5.06	115.77	108.48
1	C	73	ASP	CA-C-N	-5.04	114.47	119.56
1	C	73	ASP	C-N-CA	-5.04	114.47	119.56
1	A	130	ILE	CB-CA-C	-5.03	104.87	110.96

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	2895	0	3022	81	0
1	B	2925	0	3044	46	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2922	0	3047	64	0
1	D	2888	0	3011	67	0
2	A	123	0	0	0	0
2	B	128	0	0	3	0
2	C	105	0	0	4	0
2	D	112	0	0	4	0
All	All	12098	0	12124	252	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 11.

All (252) 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:D:72:ILE:HD13	1:D:80:ILE:CD1	1.74	1.17
1:A:72:ILE:CD1	1:A:80:ILE:HD11	1.74	1.16
1:A:72:ILE:HD13	1:A:80:ILE:HD11	1.19	1.11
1:D:72:ILE:HD13	1:D:80:ILE:HD11	1.32	1.08
1:A:72:ILE:HD13	1:A:80:ILE:CD1	1.86	1.04
1:D:9:MET:HE2	1:D:9:MET:HA	1.41	1.02
1:D:398:ILE:HG23	1:D:425:VAL:CG2	1.93	0.98
1:B:428:LEU:HD12	1:B:433:SER:OG	1.65	0.96
1:D:276:GLN:HE21	1:D:278:ASN:HD21	1.06	0.93
1:A:399:ILE:HD13	1:A:428:LEU:CD1	1.99	0.93
1:A:403:LYS:NZ	1:C:263:MET:HE3	1.85	0.90
1:B:250:ILE:HG13	1:B:250:ILE:O	1.68	0.90
1:D:72:ILE:CD1	1:D:80:ILE:HD11	2.03	0.88
1:D:189[B]:ASN:HB2	1:D:192:ASN:ND2	1.88	0.87
1:D:303:THR:H	1:D:307:GLN:NE2	1.72	0.86
1:A:399:ILE:HD13	1:A:428:LEU:HD11	1.57	0.85
1:D:72:ILE:HD13	1:D:80:ILE:HD12	1.59	0.83
1:C:322:LYS:HE3	1:C:333:THR:HG22	1.61	0.82
1:A:403:LYS:HZ1	1:C:263:MET:HE3	1.43	0.81
1:A:312:ILE:HA	1:A:315:LEU:HD22	1.60	0.81
1:D:72:ILE:CD1	1:D:80:ILE:CD1	2.58	0.81
1:D:303:THR:H	1:D:307:GLN:HE22	1.30	0.80
1:A:72:ILE:CD1	1:A:80:ILE:CD1	2.51	0.78
1:C:250:ILE:HG21	1:C:288:LEU:HD23	1.65	0.78
1:D:276:GLN:HE21	1:D:278:ASN:ND2	1.82	0.78
1:A:31:ASN:H	1:A:31:ASN:HD22	1.30	0.78
1:A:197:LEU:HD13	1:A:205:ILE:HD11	1.66	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:31:ASN:HD22	1:A:31:ASN:N	1.83	0.77
1:A:233:VAL:HG13	1:A:243:ILE:HD11	1.67	0.76
1:B:236:GLN:HE21	1:B:243:ILE:HA	1.51	0.75
1:A:189[B]:ASN:HB2	1:A:192:ASN:ND2	2.03	0.74
1:D:398:ILE:HG23	1:D:425:VAL:HG21	1.68	0.73
1:C:148:PRO:HD3	1:C:192:ASN:HD21	1.54	0.72
1:C:316:ARG:O	1:C:319:SER:HB3	1.88	0.72
1:C:276:GLN:HE21	1:C:278:ASN:HD21	1.38	0.72
1:A:189[B]:ASN:HB2	1:A:192:ASN:HD22	1.55	0.72
1:A:225:ILE:CG2	1:A:229:MET:HE2	2.20	0.71
1:A:197:LEU:HD13	1:A:205:ILE:CD1	2.22	0.70
1:C:315:LEU:HD21	1:C:319:SER:OG	1.91	0.70
1:A:189[A]:ASN:HD21	1:A:192:ASN:HD22	1.40	0.68
1:C:314:LEU:C	1:C:314:LEU:HD23	2.19	0.68
1:B:17:MET:HG2	1:B:158:GLN:NE2	2.09	0.67
1:A:276:GLN:HE21	1:A:278:ASN:HD21	1.40	0.66
1:C:392:ILE:HG13	1:C:436:LEU:HD23	1.76	0.66
1:B:151:LEU:HD13	1:B:151:LEU:O	1.95	0.66
1:D:9:MET:HA	1:D:9:MET:CE	2.23	0.66
1:B:236:GLN:HG2	1:B:243:ILE:CD1	2.25	0.66
1:D:189[B]:ASN:HB2	1:D:192:ASN:HD21	1.60	0.66
1:A:276:GLN:NE2	1:A:278:ASN:HD21	1.94	0.65
1:C:314:LEU:C	1:C:314:LEU:CD2	2.69	0.65
1:A:252:VAL:HG13	1:A:305:ALA:HB1	1.79	0.65
1:B:236:GLN:HG2	1:B:243:ILE:HD13	1.78	0.65
1:D:316:ARG:O	1:D:319:SER:HB3	1.96	0.65
1:C:322:LYS:HE3	1:C:333:THR:CG2	2.27	0.65
1:A:399:ILE:CD1	1:A:428:LEU:CD1	2.74	0.64
1:C:106:LEU:HD22	1:C:108:GLY:N	2.13	0.64
1:D:404:LYS:HE3	1:D:418:GLU:OE2	1.96	0.64
1:A:399:ILE:HD13	1:A:428:LEU:HD13	1.79	0.64
1:C:76:ASN:O	1:C:119:LYS:HE3	1.98	0.63
1:D:309:LYS:O	1:D:313:SER:HB2	1.99	0.63
1:C:225:ILE:HG23	1:C:229:MET:HE2	1.82	0.62
1:B:312:ILE:HA	1:B:315:LEU:HD22	1.81	0.62
1:C:309:LYS:O	1:C:313:SER:N	2.26	0.62
1:B:236:GLN:NE2	1:B:243:ILE:HG23	2.15	0.62
1:A:66:ILE:HD12	1:A:67:GLY:N	2.14	0.61
1:D:304:GLN:H	1:D:307:GLN:HE21	1.49	0.61
1:D:128:LEU:HD12	1:D:128:LEU:H	1.66	0.60
1:B:250:ILE:HG21	1:B:288:LEU:CD2	2.31	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:315:LEU:CD2	1:C:319:SER:OG	2.50	0.60
1:C:399:ILE:HG21	1:C:428:LEU:HD22	1.82	0.60
1:C:170:ARG:HG3	1:C:180:ASN:HD21	1.67	0.59
1:C:289:LYS:HG2	1:C:327:ARG:NH2	2.18	0.59
1:B:309:LYS:O	1:B:313:SER:HB3	2.03	0.59
1:D:186:ALA:O	1:D:188[A]:ILE:HD12	2.02	0.59
1:A:248:MET:HE1	1:A:336:ALA:HB3	1.85	0.58
1:A:422:GLU:HB2	1:A:437:LEU:CD2	2.33	0.58
1:B:16:ILE:HD11	1:B:145:ILE:HD11	1.84	0.58
1:A:146:GLY:HA3	1:A:192:ASN:OD1	2.03	0.58
1:D:434:MET:HE3	1:D:436:LEU:HD11	1.84	0.58
1:A:72:ILE:HD11	1:A:80:ILE:HD11	1.76	0.57
1:D:220:GLY:HA2	2:D:450:HOH:O	2.04	0.57
1:B:399:ILE:HD13	1:B:428:LEU:HD13	1.87	0.57
1:D:72:ILE:CD1	1:D:80:ILE:HD12	2.32	0.57
1:A:266:PRO:HD2	1:A:269:PHE:HB2	1.86	0.57
1:D:261:GLN:NE2	1:D:267:GLU:HB2	2.19	0.57
1:A:72:ILE:CG2	1:A:80:ILE:HD12	2.35	0.56
1:B:136:LEU:HD21	1:B:205:ILE:HD13	1.88	0.56
1:B:189[B]:ASN:HB2	1:B:192:ASN:ND2	2.20	0.56
1:C:258:GLU:HG3	1:D:100:ARG:HG3	1.86	0.56
1:B:250:ILE:HG21	1:B:288:LEU:HD23	1.88	0.56
1:D:189[B]:ASN:HB2	1:D:192:ASN:HD22	1.68	0.56
1:D:189[B]:ASN:O	1:D:190[B]:PRO:C	2.48	0.56
1:A:225:ILE:HG23	1:A:229:MET:HE2	1.88	0.56
1:C:29:LEU:HD12	1:C:61:ARG:HG3	1.88	0.56
1:C:320:THR:HG23	2:C:489:HOH:O	2.05	0.56
1:D:248:MET:HE1	1:D:321:VAL:HG11	1.88	0.56
1:C:227:ILE:HD12	1:C:230:VAL:HB	1.87	0.55
1:C:296:GLN:HA	1:C:302:ILE:HD12	1.89	0.55
1:B:250:ILE:CG2	1:B:283:ALA:CB	2.85	0.55
1:C:419:LYS:HG3	1:C:420:LYS:N	2.21	0.55
1:A:106:LEU:HD22	1:A:108:GLY:N	2.22	0.55
1:A:106:LEU:CD2	1:A:108:GLY:N	2.71	0.54
1:B:211:ILE:O	1:B:212:LEU:HB3	2.07	0.54
1:B:188[A]:ILE:HD12	1:B:208:ASN:HB3	1.90	0.54
1:A:189[A]:ASN:C	1:A:189[A]:ASN:HD22	2.16	0.54
1:A:286:ALA:HB2	1:A:336:ALA:HB2	1.89	0.54
1:A:72:ILE:HG12	1:A:80:ILE:HD12	1.90	0.54
1:D:72:ILE:HG21	1:D:80:ILE:HD12	1.90	0.54
1:D:398:ILE:CG2	1:D:425:VAL:CG2	2.78	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:106:LEU:HD22	1:D:108:GLY:H	1.72	0.53
1:D:107:ILE:HD12	1:D:117:VAL:HG12	1.91	0.53
1:C:146:GLY:HA3	1:C:192:ASN:HD22	1.73	0.53
1:D:402:ASN:O	1:D:403:LYS:HB2	2.09	0.53
1:D:106:LEU:HD22	1:D:108:GLY:N	2.24	0.53
1:C:265:TYR:HE2	1:C:326:GLU:HG2	1.74	0.52
1:D:398:ILE:CG2	1:D:425:VAL:HG21	2.38	0.52
1:A:403:LYS:HZ2	1:C:263:MET:HE3	1.68	0.52
1:A:72:ILE:CG1	1:A:80:ILE:CD1	2.88	0.52
1:A:189[A]:ASN:HB2	1:A:190[A]:PRO:HD2	1.92	0.52
1:C:286:ALA:O	1:C:334:LEU:HD22	2.10	0.52
1:A:311:THR:O	1:A:315:LEU:HD13	2.10	0.51
1:A:399:ILE:CD1	1:A:428:LEU:HD11	2.36	0.51
1:B:250:ILE:HG23	1:B:283:ALA:CB	2.40	0.51
1:C:17:MET:N	1:C:18:PRO:CD	2.73	0.51
1:C:276:GLN:NE2	1:C:278:ASN:HD21	2.05	0.51
2:C:521:HOH:O	1:D:6:MET:HE1	2.09	0.51
1:C:292:ASP:HB3	1:C:325:VAL:CG2	2.41	0.51
1:C:322:LYS:CE	1:C:333:THR:HG22	2.37	0.51
1:A:72:ILE:CG1	1:A:80:ILE:HD12	2.41	0.50
1:A:128:LEU:N	1:A:128:LEU:HD12	2.26	0.50
1:C:428:LEU:HD12	1:C:433:SER:OG	2.11	0.50
1:D:263:MET:HE1	1:D:273:LEU:CD1	2.42	0.50
1:B:428:LEU:HD12	1:B:433:SER:HG	1.73	0.50
1:C:146:GLY:HA3	1:C:192:ASN:ND2	2.27	0.50
1:B:13:LEU:O	1:B:17:MET:HG3	2.11	0.50
1:D:128:LEU:HD12	1:D:128:LEU:N	2.26	0.49
1:C:245:ARG:HG2	1:C:313:SER:O	2.12	0.49
1:B:240:PHE:CZ	1:B:316:ARG:HD2	2.47	0.49
1:A:422:GLU:HB2	1:A:437:LEU:HD22	1.95	0.49
1:B:179:GLU:HG2	1:B:180:ASN:H	1.78	0.49
1:C:292:ASP:HB3	1:C:325:VAL:HG21	1.95	0.49
1:A:422:GLU:HB2	1:A:437:LEU:HD21	1.94	0.49
1:A:106:LEU:CD2	1:A:108:GLY:H	2.25	0.48
1:D:130:ILE:HD11	1:D:231:LYS:CD	2.43	0.48
1:C:225:ILE:CG2	1:C:229:MET:HE2	2.42	0.48
1:D:17:MET:HB2	1:D:18:PRO:HD3	1.95	0.48
1:D:240:PHE:CE2	1:D:316:ARG:HD2	2.48	0.48
1:B:428:LEU:CD1	1:B:433:SER:OG	2.50	0.48
1:A:86:ILE:C	1:A:86:ILE:HD12	2.38	0.48
1:A:259:LEU:O	1:A:263:MET:HG3	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:276:GLN:NE2	1:D:278:ASN:HD21	1.90	0.48
1:A:421:LYS:HG3	1:A:422:GLU:HG2	1.95	0.48
1:A:310:THR:O	1:A:314:LEU:HD22	2.14	0.47
1:A:248:MET:HG3	1:A:312:ILE:HG21	1.96	0.47
1:A:248:MET:HE1	1:A:336:ALA:CB	2.44	0.47
1:A:31:ASN:N	1:A:31:ASN:ND2	2.55	0.47
1:B:82:ASN:ND2	1:B:193:SER:OG	2.47	0.47
1:D:129:VAL:HG13	2:D:512:HOH:O	2.15	0.47
1:A:9:MET:HE2	1:A:9:MET:HA	1.96	0.47
1:A:167:ALA:O	1:A:168:LEU:HD23	2.15	0.47
1:A:225:ILE:HG23	1:A:229:MET:CE	2.44	0.47
1:B:128:LEU:N	1:B:128:LEU:HD12	2.30	0.47
1:C:29:LEU:HD12	1:C:61:ARG:CG	2.45	0.47
1:A:72:ILE:HG21	1:A:80:ILE:HD12	1.96	0.47
1:A:128:LEU:HD12	1:A:128:LEU:H	1.80	0.47
1:A:384:ASN:HA	1:D:91:LEU:HD11	1.97	0.47
1:C:250:ILE:HG21	1:C:288:LEU:CD2	2.40	0.46
1:A:376:VAL:HG13	1:A:406:VAL:CG1	2.46	0.46
1:C:327:ARG:HG3	1:C:332:LEU:HD12	1.97	0.46
1:D:304:GLN:N	1:D:307:GLN:HE21	2.11	0.46
1:C:128:LEU:HD21	1:C:204:LEU:HB2	1.98	0.46
1:B:180:ASN:OD1	1:B:180:ASN:C	2.58	0.46
1:C:106:LEU:HD22	1:C:108:GLY:H	1.79	0.46
1:A:146:GLY:CA	1:A:192:ASN:OD1	2.64	0.46
1:D:247:LEU:HG	1:D:248:MET:N	2.29	0.46
1:C:189[B]:ASN:HB2	1:C:192:ASN:OD1	2.16	0.46
1:C:209:THR:HG22	1:C:211:ILE:HG12	1.97	0.46
1:A:189[B]:ASN:O	1:A:190[B]:PRO:C	2.57	0.45
1:A:219:VAL:O	1:A:219:VAL:HG22	2.15	0.45
1:B:399:ILE:CD1	1:B:428:LEU:HD13	2.45	0.45
1:A:316:ARG:O	1:A:319:SER:OG	2.24	0.45
1:A:72:ILE:HG12	1:A:80:ILE:CD1	2.47	0.45
1:B:128:LEU:HD12	1:B:128:LEU:H	1.81	0.45
1:A:132:ASP:HA	1:A:228:ASN:HD21	1.82	0.45
1:C:128:LEU:CD2	1:C:204:LEU:HB2	2.47	0.45
1:D:254:HIS:HD2	2:D:482:HOH:O	2.01	0.44
1:A:13:LEU:O	1:A:17:MET:HG2	2.17	0.44
1:D:297:ILE:HG13	1:D:302:ILE:HD13	1.98	0.44
1:B:344:HIS:ND1	2:B:547:HOH:O	2.33	0.44
1:C:320:THR:CG2	2:C:489:HOH:O	2.64	0.44
1:D:321:VAL:HG12	1:D:336:ALA:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:231:LYS:NZ	2:B:560:HOH:O	2.51	0.44
1:C:170:ARG:HG3	1:C:180:ASN:ND2	2.30	0.44
1:B:258:GLU:HG3	2:B:508:HOH:O	2.18	0.44
1:A:189[A]:ASN:HB2	1:A:190[A]:PRO:CD	2.48	0.44
1:C:91:LEU:HD23	2:C:519:HOH:O	2.18	0.43
1:C:148:PRO:HG2	1:C:149:PHE:CE2	2.53	0.43
1:A:66:ILE:HD12	1:A:66:ILE:C	2.43	0.43
1:D:73:ASP:HB3	1:D:78:VAL:HB	2.00	0.43
1:B:86:ILE:C	1:B:86:ILE:HD12	2.44	0.43
1:D:296:GLN:HE21	1:D:296:GLN:HB2	1.70	0.43
1:A:151:LEU:CD1	1:A:151:LEU:N	2.81	0.43
1:B:98:ASP:OD1	1:B:98:ASP:C	2.62	0.43
1:B:168:LEU:O	1:B:169:LYS:HB3	2.17	0.43
1:A:347:LYS:O	1:A:351:ASN:HB3	2.19	0.43
1:B:151:LEU:HD13	1:B:151:LEU:C	2.43	0.43
1:C:86:ILE:HD12	1:C:86:ILE:C	2.44	0.42
1:C:419:LYS:HG3	1:C:420:LYS:H	1.81	0.42
1:D:72:ILE:CG2	1:D:80:ILE:HD12	2.49	0.42
1:D:101:ARG:C	1:D:102:LEU:HD13	2.45	0.42
1:A:10:ALA:N	1:A:11:PRO:CD	2.83	0.42
1:D:199:ASN:N	1:D:205:ILE:CD1	2.83	0.42
1:A:225:ILE:CG2	1:A:229:MET:CE	2.96	0.42
1:C:400:SER:HB2	1:C:404:LYS:O	2.20	0.42
1:B:316:ARG:O	1:B:317:VAL:C	2.62	0.42
1:B:316:ARG:O	1:B:319:SER:OG	2.36	0.42
1:C:434:MET:HG2	1:C:436:LEU:HD13	2.01	0.42
1:B:201:LYS:HD2	1:C:6:MET:SD	2.60	0.42
1:A:346:GLN:HA	1:A:346:GLN:HE21	1.85	0.42
1:C:302:ILE:HA	1:C:307:GLN:OE1	2.19	0.42
1:C:309:LYS:HG2	1:C:313:SER:HB2	2.01	0.42
1:B:236:GLN:HG2	1:B:243:ILE:HD12	2.01	0.41
1:D:408:ASP:HB2	2:D:541:HOH:O	2.20	0.41
1:A:276:GLN:HE21	1:A:278:ASN:ND2	2.14	0.41
1:A:276:GLN:NE2	1:A:278:ASN:ND2	2.66	0.41
1:B:128:LEU:HD22	1:B:204:LEU:HB2	2.03	0.41
1:C:83:ASP:OD1	1:C:87:ARG:NH1	2.47	0.41
1:D:16:ILE:HG22	1:D:128:LEU:HB3	2.00	0.41
1:D:82:ASN:ND2	1:D:193:SER:OG	2.53	0.41
1:B:9:MET:HE3	1:B:9:MET:HB3	1.97	0.41
1:B:16:ILE:HD11	1:B:145:ILE:CD1	2.50	0.41
1:C:418:GLU:HG2	1:C:419:LYS:H	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:418:GLU:CG	1:C:419:LYS:N	2.83	0.41
1:D:107:ILE:HD11	1:D:119:LYS:HB2	2.03	0.41
1:A:151:LEU:N	1:A:151:LEU:HD13	2.36	0.41
1:A:250:ILE:HD13	1:A:250:ILE:HG21	1.85	0.41
1:D:400:SER:O	1:D:425:VAL:HG23	2.20	0.41
1:D:205:ILE:C	1:D:227:ILE:HB	2.46	0.41
1:A:95:THR:OG1	1:A:101:ARG:HD2	2.21	0.41
1:B:113:THR:CG2	1:B:229:MET:HE3	2.50	0.41
1:D:286:ALA:HB2	1:D:336:ALA:HB2	2.03	0.41
1:D:325:VAL:O	1:D:331:PRO:HA	2.21	0.41
1:D:398:ILE:HG23	1:D:425:VAL:HG23	1.90	0.41
1:C:15:ASN:HD22	1:C:15:ASN:HA	1.72	0.41
1:D:228:ASN:HA	1:D:231:LYS:HE3	2.03	0.41
1:C:257:PRO:O	1:C:260:ALA:HB3	2.21	0.40
1:A:188[B]:ILE:HD13	1:A:188[B]:ILE:HA	1.92	0.40
1:A:383:GLU:HA	1:A:388:TRP:CG	2.57	0.40
1:C:285:LEU:HD22	1:C:285:LEU:O	2.21	0.40
1:D:66:ILE:N	1:D:66:ILE:CD1	2.84	0.40
1:B:119:LYS:HG3	1:B:120:ILE:N	2.37	0.40
1:D:303:THR:N	1:D:307:GLN:NE2	2.55	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	378/451 (84%)	373 (99%)	5 (1%)	0	100 100
1	B	384/451 (85%)	376 (98%)	6 (2%)	2 (0%)	24 20
1	C	382/451 (85%)	369 (97%)	13 (3%)	0	100 100
1	D	377/451 (84%)	370 (98%)	5 (1%)	2 (0%)	24 20
All	All	1521/1804 (84%)	1488 (98%)	29 (2%)	4 (0%)	48 34

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	190[A]	PRO
1	D	190[B]	PRO
1	B	190[A]	PRO
1	B	190[B]	PRO

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	319/372 (86%)	284 (89%)	35 (11%)	6	3
1	B	322/372 (87%)	290 (90%)	32 (10%)	7	4
1	C	321/372 (86%)	277 (86%)	44 (14%)	3	1
1	D	318/372 (86%)	274 (86%)	44 (14%)	3	1
All	All	1280/1488 (86%)	1125 (88%)	155 (12%)	5	2

All (155) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	VAL
1	A	16	ILE
1	A	31	ASN
1	A	66	ILE
1	A	106	LEU
1	A	125	LEU
1	A	128	LEU
1	A	151	LEU
1	A	158	GLN
1	A	159	SER
1	A	169	LYS
1	A	188[A]	ILE
1	A	188[B]	ILE
1	A	189[A]	ASN
1	A	189[B]	ASN
1	A	197	LEU

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Mol	Chain	Res	Type
1	A	252	VAL
1	A	285	LEU
1	A	314	LEU
1	A	315	LEU
1	A	317	VAL
1	A	319	SER
1	A	321	VAL
1	A	345	GLU
1	A	346	GLN
1	A	348	LEU
1	A	351	ASN
1	A	376	VAL
1	A	407	THR
1	A	417	GLN
1	A	423	LEU
1	A	425	VAL
1	A	433	SER
1	A	436	LEU
1	A	437	LEU
1	B	12	VAL
1	B	61	ARG
1	B	91	LEU
1	B	106	LEU
1	B	123	LYS
1	B	124	ASN
1	B	125	LEU
1	B	126	LYS
1	B	128	LEU
1	B	151	LEU
1	B	169	LYS
1	B	179	GLU
1	B	180	ASN
1	B	197	LEU
1	B	211	ILE
1	B	212	LEU
1	B	219	VAL
1	B	239	LYS
1	B	259	LEU
1	B	276	GLN
1	B	285	LEU
1	B	302	ILE
1	B	304	GLN

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Mol	Chain	Res	Type
1	B	315	LEU
1	B	316	ARG
1	B	319	SER
1	B	321	VAL
1	B	346	GLN
1	B	417	GLN
1	B	428	LEU
1	B	434	MET
1	B	436	LEU
1	C	14	LYS
1	C	16	ILE
1	C	26	GLN
1	C	61	ARG
1	C	91	LEU
1	C	102	LEU
1	C	106	LEU
1	C	125	LEU
1	C	126	LYS
1	C	128	LEU
1	C	145	ILE
1	C	149	PHE
1	C	151	LEU
1	C	156	ASN
1	C	180	ASN
1	C	212	LEU
1	C	219	VAL
1	C	233	VAL
1	C	252	VAL
1	C	255	LEU
1	C	259	LEU
1	C	267	GLU
1	C	276	GLN
1	C	285	LEU
1	C	300	THR
1	C	301	LYS
1	C	314	LEU
1	C	315	LEU
1	C	321	VAL
1	C	325	VAL
1	C	326	GLU
1	C	330	LYS
1	C	341	ILE

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Mol	Chain	Res	Type
1	C	343	SER
1	C	346	GLN
1	C	348	LEU
1	C	367	SER
1	C	403	LYS
1	C	410	LYS
1	C	419	LYS
1	C	420	LYS
1	C	428	LEU
1	C	436	LEU
1	C	437	LEU
1	D	14	LYS
1	D	16	ILE
1	D	17	MET
1	D	61	ARG
1	D	62	LYS
1	D	65	SER
1	D	66	ILE
1	D	91	LEU
1	D	102	LEU
1	D	106	LEU
1	D	124	ASN
1	D	125	LEU
1	D	128	LEU
1	D	129	VAL
1	D	130	ILE
1	D	169	LYS
1	D	188[A]	ILE
1	D	188[B]	ILE
1	D	205	ILE
1	D	211	ILE
1	D	235	GLN
1	D	243	ILE
1	D	247	LEU
1	D	252	VAL
1	D	257	PRO
1	D	259	LEU
1	D	285	LEU
1	D	288	LEU
1	D	296	GLN
1	D	302	ILE
1	D	304	GLN

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Mol	Chain	Res	Type
1	D	310	THR
1	D	313	SER
1	D	316	ARG
1	D	317	VAL
1	D	342	LYS
1	D	346	GLN
1	D	348	LEU
1	D	403	LYS
1	D	410	LYS
1	D	419	LYS
1	D	433	SER
1	D	436	LEU
1	D	437	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (46) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	15	ASN
1	A	31	ASN
1	A	208	ASN
1	A	228	ASN
1	A	276	GLN
1	A	278	ASN
1	A	346	GLN
1	A	351	ASN
1	A	365	GLN
1	A	384	ASN
1	A	417	GLN
1	B	15	ASN
1	B	22	ASN
1	B	26	GLN
1	B	76	ASN
1	B	82	ASN
1	B	97	GLN
1	B	152	ASN
1	B	158	GLN
1	B	208	ASN
1	B	236	GLN
1	B	254	HIS
1	B	344	HIS
1	B	349	GLN
1	C	15	ASN

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Mol	Chain	Res	Type
1	C	82	ASN
1	C	97	GLN
1	C	180	ASN
1	C	192	ASN
1	C	208	ASN
1	C	228	ASN
1	C	278	ASN
1	C	307	GLN
1	C	344	HIS
1	C	346	GLN
1	D	15	ASN
1	D	76	ASN
1	D	82	ASN
1	D	235	GLN
1	D	254	HIS
1	D	261	GLN
1	D	278	ASN
1	D	296	GLN
1	D	307	GLN
1	D	346	GLN
1	D	351	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 [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	384/451 (85%)	0.37	28 (7%) 21 24	21, 46, 76, 117	4 (1%)
1	B	388/451 (86%)	0.52	26 (6%) 24 27	23, 47, 78, 133	4 (1%)
1	C	388/451 (86%)	0.83	72 (18%) 3 4	21, 53, 96, 112	4 (1%)
1	D	383/451 (84%)	0.54	31 (8%) 18 19	22, 51, 79, 117	4 (1%)
All	All	1543/1804 (85%)	0.57	157 (10%) 12 13	21, 49, 87, 133	16 (1%)

All (157) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	155	GLY	7.0
1	A	212	LEU	6.2
1	C	314	LEU	5.9
1	C	219	VAL	5.6
1	D	29	LEU	5.5
1	C	151	LEU	5.3
1	C	212	LEU	5.3
1	D	30	PRO	5.2
1	D	219	VAL	4.9
1	B	212	LEU	4.8
1	B	7	PRO	4.8
1	C	211	ILE	4.7
1	C	302	ILE	4.7
1	C	329	ASN	4.6
1	B	219	VAL	4.6
1	A	351	ASN	4.4
1	B	154	PHE	4.4
1	A	6	MET	4.3
1	D	157	SER	4.3
1	D	149	PHE	4.2
1	C	312	ILE	4.2

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Mol	Chain	Res	Type	RSRZ
1	C	60	GLY	4.0
1	D	211	ILE	4.0
1	C	220	GLY	3.7
1	C	310	THR	3.7
1	B	151	LEU	3.7
1	B	149	PHE	3.7
1	C	264	GLY	3.6
1	B	29	LEU	3.6
1	C	6	MET	3.5
1	A	151	LEU	3.5
1	A	31	ASN	3.5
1	C	322	LYS	3.4
1	D	220	GLY	3.4
1	C	170	ARG	3.4
1	C	29	LEU	3.4
1	C	301	LYS	3.3
1	D	28	TYR	3.3
1	A	30	PRO	3.3
1	B	30	PRO	3.3
1	C	246	GLY	3.2
1	D	180	ASN	3.2
1	A	301	LYS	3.2
1	D	151	LEU	3.1
1	A	219	VAL	3.1
1	B	28	TYR	3.1
1	B	309	LYS	3.1
1	B	220	GLY	3.1
1	C	317	VAL	3.1
1	D	130	ILE	3.1
1	A	157	SER	3.1
1	C	269	PHE	3.0
1	D	192	ASN	3.0
1	B	179	GLU	2.9
1	A	150	GLY	2.9
1	C	305	ALA	2.9
1	A	220	GLY	2.9
1	C	190[A]	PRO	2.9
1	A	350	SER	2.9
1	D	6	MET	2.8
1	C	180	ASN	2.8
1	C	313	SER	2.8
1	D	244	HIS	2.8

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Mol	Chain	Res	Type	RSRZ
1	B	250	ILE	2.8
1	C	323	ILE	2.8
1	C	332	LEU	2.8
1	C	156	ASN	2.8
1	C	327	ARG	2.8
1	D	313	SER	2.8
1	C	266	PRO	2.8
1	C	308	VAL	2.8
1	C	296	GLN	2.7
1	A	149	PHE	2.7
1	C	30	PRO	2.7
1	C	267	GLU	2.7
1	D	169	LYS	2.7
1	A	28	TYR	2.7
1	D	346	GLN	2.7
1	C	330	LYS	2.7
1	C	306	THR	2.7
1	C	320	THR	2.7
1	D	340	ASP	2.7
1	B	169	LYS	2.7
1	D	62	LYS	2.7
1	B	351	ASN	2.6
1	C	315	LEU	2.6
1	D	266	PRO	2.6
1	A	312	ILE	2.6
1	A	7	PRO	2.6
1	A	310	THR	2.6
1	C	7	PRO	2.6
1	A	29	LEU	2.6
1	B	61	ARG	2.5
1	C	300	THR	2.5
1	C	250	ILE	2.5
1	C	421	LYS	2.5
1	D	256	THR	2.5
1	C	260	ALA	2.5
1	C	251	PHE	2.5
1	B	211	ILE	2.5
1	C	321	VAL	2.5
1	D	351	ASN	2.5
1	C	265	TYR	2.5
1	D	181	PHE	2.4
1	C	336	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	255	LEU	2.4
1	B	63	PHE	2.4
1	C	232	ASP	2.4
1	D	268	ASP	2.4
1	A	250	ILE	2.4
1	C	328	ASP	2.4
1	C	169	LYS	2.4
1	A	61	ARG	2.3
1	B	251	PHE	2.3
1	C	337	VAL	2.3
1	C	295	THR	2.3
1	D	368	PRO	2.3
1	D	419	LYS	2.3
1	C	402	ASN	2.3
1	C	341	ILE	2.3
1	C	324	ILE	2.2
1	A	180	ASN	2.2
1	A	192	ASN	2.2
1	C	192	ASN	2.2
1	C	298	ASN	2.2
1	C	326	GLU	2.2
1	C	263	MET	2.2
1	C	299	ASP	2.2
1	B	155	GLY	2.2
1	C	285	LEU	2.2
1	A	169	LYS	2.2
1	C	331	PRO	2.2
1	D	7	PRO	2.2
1	C	268	ASP	2.2
1	B	91	LEU	2.2
1	B	315	LEU	2.2
1	C	254	HIS	2.1
1	A	330	LYS	2.1
1	D	410	LYS	2.1
1	A	243	ILE	2.1
1	C	346	GLN	2.1
1	D	261	GLN	2.1
1	B	317	VAL	2.1
1	C	439	ILE	2.1
1	D	123	LYS	2.1
1	A	314	LEU	2.1
1	D	314	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	152	ASN	2.1
1	A	315	LEU	2.0
1	B	417	GLN	2.0
1	C	417	GLN	2.0
1	C	311	THR	2.0
1	B	62	LYS	2.0
1	C	309	LYS	2.0
1	C	419	LYS	2.0
1	C	325	VAL	2.0
1	A	309	LYS	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 oligosaccharides 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.