



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 07:30 AM UTC

PDB ID : 2Q53 / pdb_00002q53
Title : Ensemble refinement of the crystal structure of uncharacterized protein loc79017 from Homo sapiens
Authors : Levin, E.J.; Kondrashov, D.A.; Wesenberg, G.E.; Phillips Jr., G.N.; Center for Eukaryotic Structural Genomics (CESG)
Deposited on : 2007-05-31
Resolution : 2.01 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 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

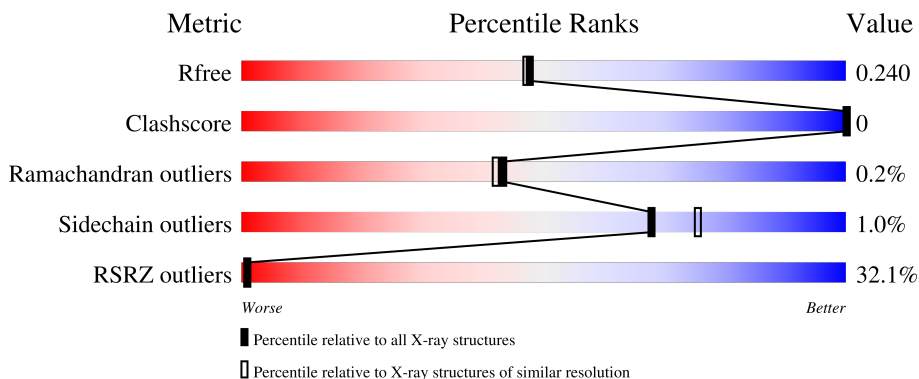
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.01 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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 $\leq 5\%$. 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	1-A	188	
1	1-B	188	
1	2-A	188	
1	2-B	188	
1	3-A	188	

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Mol	Chain	Length	Quality of chain
1	3-B	188	 88% • 10%
1	4-A	188	 89% • 10%
1	4-B	188	 88% • 10%

2 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 11288 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 Uncharacterized protein C7orf24.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	1-A	169	1343	855	220	261	3	4	0	0	0
1	2-A	169	1343	855	220	261	3	4	0	0	0
1	3-A	169	1343	855	220	261	3	4	0	0	0
1	4-A	169	1343	855	220	261	3	4	0	0	0
1	1-B	169	1338	852	220	259	3	4	0	0	0
1	2-B	169	1338	852	220	259	3	4	0	0	0
1	3-B	169	1338	852	220	259	3	4	0	0	0
1	4-B	169	1338	852	220	259	3	4	0	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	SER	-	expression tag	UNP O75223
A	86	MSE	MET	modified residue	UNP O75223
A	104	MSE	MET	modified residue	UNP O75223
A	127	MSE	MET	modified residue	UNP O75223
A	145	MSE	MET	modified residue	UNP O75223
B	1	SER	-	expression tag	UNP O75223
B	86	MSE	MET	modified residue	UNP O75223
B	104	MSE	MET	modified residue	UNP O75223
B	127	MSE	MET	modified residue	UNP O75223
B	145	MSE	MET	modified residue	UNP O75223

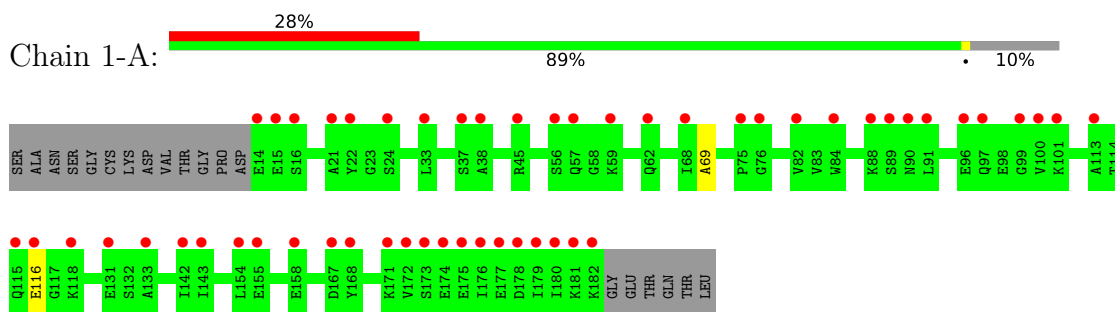
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	1-A	76	Total O 76 76	0	0
2	2-A	76	Total O 76 76	0	0
2	3-A	73	Total O 73 73	0	0
2	4-A	77	Total O 77 77	0	0
2	1-B	65	Total O 65 65	0	0
2	2-B	65	Total O 65 65	0	0
2	3-B	68	Total O 68 68	0	0
2	4-B	64	Total O 64 64	0	0

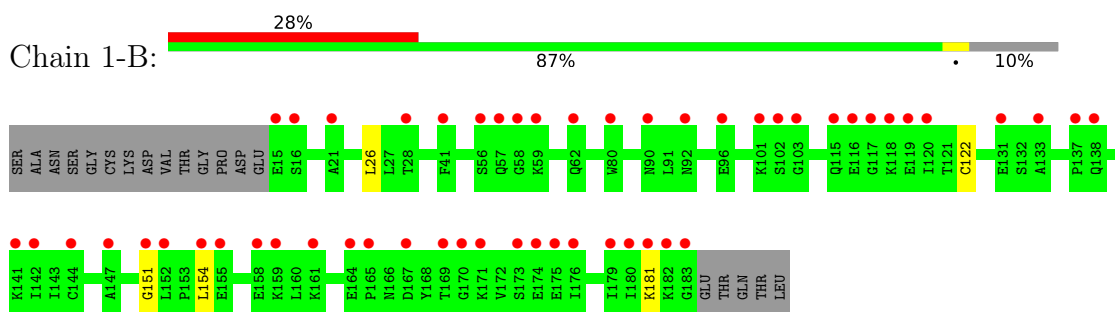
3 Residue-property plots [i](#)

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.

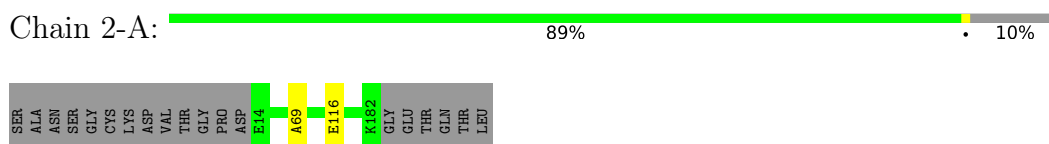
- Molecule 1: Uncharacterized protein C7orf24



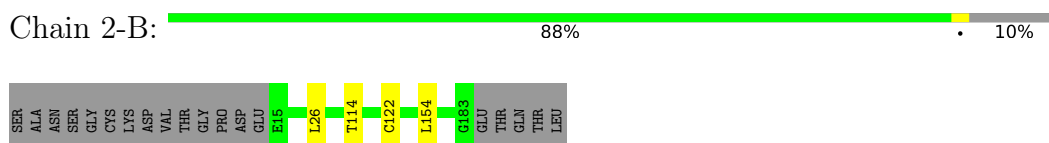
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- Molecule 1: Uncharacterized protein C7orf24

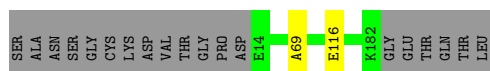


- Molecule 1: Uncharacterized protein C7orf24





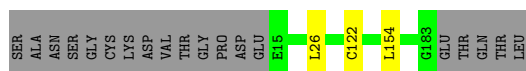
- Molecule 1: Uncharacterized protein C7orf24

Chain 3-A:  89%  10%



• Molecule 1: Uncharacterized protein C7orf24

Chain 3-B:  88%  10%





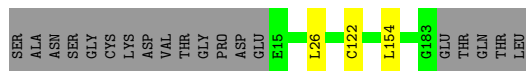
• Molecule 1: Uncharacterized protein C7orf24

Chain 4-A:  89%  10%



• Molecule 1: Uncharacterized protein C7orf24

Chain 4-B:  88%  10%



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	35.05Å 100.14Å 102.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.99 – 2.01 44.99 – 2.01	Depositor EDS
% Data completeness (in resolution range)	97.4 (44.99-2.01) 97.5 (44.99-2.01)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.36 (at 2.01Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.189 , 0.235 0.197 , 0.240	Depositor DCC
R_{free} test set	1233 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	19.6	Xtrriage
Anisotropy	0.085	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.09 , 39.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.019 for -h,l,k	Xtrriage
F_o, F_c correlation	0.86	EDS
Total number of atoms	11288	wwPDB-VP
Average B, all atoms (Å ²)	18.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.31% 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	1-A	0.24	0/1368	0.51	1/1839 (0.1%)
1	1-B	0.24	0/1363	0.55	1/1832 (0.1%)
1	2-A	0.24	0/1368	0.51	1/1839 (0.1%)
1	2-B	0.24	0/1363	0.55	1/1832 (0.1%)
1	3-A	0.24	0/1368	0.51	1/1839 (0.1%)
1	3-B	0.24	0/1363	0.55	1/1832 (0.1%)
1	4-A	0.24	0/1368	0.51	1/1839 (0.1%)
1	4-B	0.24	0/1363	0.55	1/1832 (0.1%)
All	All	0.24	0/10924	0.53	8/14684 (0.1%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1-A	69	ALA	N-CA-C	5.71	118.72	110.28
1	2-A	69	ALA	N-CA-C	5.71	118.72	110.28
1	3-A	69	ALA	N-CA-C	5.71	118.72	110.28
1	4-A	69	ALA	N-CA-C	5.71	118.72	110.28
1	1-B	26	LEU	N-CA-C	-5.00	106.69	112.89
1	2-B	26	LEU	N-CA-C	-5.00	106.69	112.89
1	3-B	26	LEU	N-CA-C	-5.00	106.69	112.89
1	4-B	26	LEU	N-CA-C	-5.00	106.69	112.89

There are no chirality outliers.

There are no planarity outliers.

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	1-A	1343	0	1317	0	0
1	1-B	1338	0	1314	0	0
1	2-A	1343	0	1317	0	0
1	2-B	1338	0	1314	0	0
1	3-A	1343	0	1317	0	0
1	3-B	1338	0	1314	0	0
1	4-A	1343	0	1317	0	0
1	4-B	1338	0	1314	0	0
2	1-A	76	0	0	0	0
2	1-B	65	0	0	0	0
2	2-A	76	0	0	0	0
2	2-B	65	0	0	0	0
2	3-A	73	0	0	0	0
2	3-B	68	0	0	0	0
2	4-A	77	0	0	0	0
2	4-B	64	0	0	0	0
All	All	11288	0	10524	0	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 0.

There are no clashes within the asymmetric unit.

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	1-A	167/188 (89%)	156 (93%)	11 (7%)	0	100 100
1	1-B	167/188 (89%)	156 (93%)	9 (5%)	2 (1%)	10 6
1	2-A	167/188 (89%)	161 (96%)	6 (4%)	0	100 100
1	2-B	167/188 (89%)	156 (93%)	10 (6%)	1 (1%)	21 17
1	3-A	167/188 (89%)	158 (95%)	9 (5%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	3-B	167/188 (89%)	154 (92%)	13 (8%)	0	100	100
1	4-A	167/188 (89%)	156 (93%)	11 (7%)	0	100	100
1	4-B	167/188 (89%)	164 (98%)	3 (2%)	0	100	100
All	All	1336/1504 (89%)	1261 (94%)	72 (5%)	3 (0%)	43	42

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	2-B	114	THR
1	1-B	151	GLY
1	1-B	181	LYS

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	1-A	147/158 (93%)	146 (99%)	1 (1%)	76	82
1	1-B	146/158 (92%)	144 (99%)	2 (1%)	59	66
1	2-A	147/158 (93%)	146 (99%)	1 (1%)	76	82
1	2-B	146/158 (92%)	144 (99%)	2 (1%)	59	66
1	3-A	147/158 (93%)	146 (99%)	1 (1%)	76	82
1	3-B	146/158 (92%)	144 (99%)	2 (1%)	59	66
1	4-A	147/158 (93%)	146 (99%)	1 (1%)	76	82
1	4-B	146/158 (92%)	144 (99%)	2 (1%)	59	66
All	All	1172/1264 (93%)	1160 (99%)	12 (1%)	68	75

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1-A	116	GLU
1	1-B	122	CYS
1	1-B	154	LEU

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Mol	Chain	Res	Type
1	2-A	116	GLU
1	2-B	122	CYS
1	2-B	154	LEU
1	3-A	116	GLU
1	3-B	122	CYS
1	3-B	154	LEU
1	4-A	116	GLU
1	4-B	122	CYS
1	4-B	154	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
1	1-A	35	ASN
1	1-A	57	GLN
1	1-A	65	HIS
1	1-A	97	GLN
1	1-B	87	ASN
1	1-B	90	ASN
1	1-B	150	ASN
1	2-A	57	GLN
1	2-A	90	ASN
1	2-A	150	ASN
1	2-B	57	GLN
1	2-B	65	HIS
1	2-B	87	ASN
1	2-B	90	ASN
1	2-B	150	ASN
1	3-A	35	ASN
1	3-A	97	GLN
1	3-B	55	ASN
1	3-B	57	GLN
1	3-B	65	HIS
1	3-B	87	ASN
1	3-B	90	ASN
1	3-B	150	ASN
1	4-A	35	ASN
1	4-A	57	GLN
1	4-A	65	HIS
1	4-A	90	ASN
1	4-A	97	GLN
1	4-B	87	ASN

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Mol	Chain	Res	Type
1	4-B	90	ASN
1	4-B	157	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

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	1-A	165/188 (87%)	1.60	53 (32%) 1 1	1, 4, 9, 13	165 (100%)
1	1-B	165/188 (87%)	1.73	53 (32%) 1 1	2, 4, 9, 14	165 (100%)
1	2-A	0/188	-	-	-	-
1	2-B	0/188	-	-	-	-
1	3-A	0/188	-	-	-	-
1	3-B	0/188	-	-	-	-
1	4-A	0/188	-	-	-	-
1	4-B	0/188	-	-	-	-
All	All	330/1504 (21%)	1.66	106 (32%) 1 1	1, 4, 9, 14	330 (100%)

All (106) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	1-B	144	CYS	6.2
1	1-A	172	VAL	5.3
1	1-B	183	GLY	5.1
1	1-A	178	ASP	4.7
1	1-B	59	LYS	4.5
1	1-A	182	LYS	4.5
1	1-B	182	LYS	4.3
1	1-A	14	GLU	4.2
1	1-A	16	SER	4.2
1	1-A	174	GLU	4.2
1	1-A	96	GLU	4.0
1	1-A	90	ASN	3.9
1	1-A	131	GLU	3.9
1	1-A	181	LYS	3.8
1	1-B	180	ILE	3.8
1	1-B	92	ASN	3.7
1	1-B	179	ILE	3.7
1	1-A	33	LEU	3.6

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Mol	Chain	Res	Type	RSRZ
1	1-B	57	GLN	3.6
1	1-B	41	PHE	3.6
1	1-B	161	LYS	3.6
1	1-B	151	GLY	3.6
1	1-A	115	GLN	3.6
1	1-B	158	GLU	3.5
1	1-B	181	LYS	3.5
1	1-B	103	GLY	3.5
1	1-A	180	ILE	3.5
1	1-A	113	ALA	3.5
1	1-B	174	GLU	3.5
1	1-B	154	LEU	3.4
1	1-B	142	ILE	3.4
1	1-B	171	LYS	3.3
1	1-A	45	ARG	3.3
1	1-B	118	LYS	3.3
1	1-B	120	ILE	3.3
1	1-A	167	ASP	3.2
1	1-A	89	SER	3.2
1	1-B	80	TRP	3.2
1	1-A	116	GLU	3.2
1	1-B	119	GLU	3.2
1	1-A	155	GLU	3.2
1	1-A	68	ILE	3.2
1	1-A	76	GLY	3.1
1	1-A	158	GLU	3.1
1	1-A	15	GLU	3.1
1	1-A	142	ILE	3.1
1	1-A	177	GLU	3.0
1	1-B	141	LYS	3.0
1	1-A	176	ILE	3.0
1	1-B	56	SER	2.9
1	1-B	102	SER	2.9
1	1-B	101	LYS	2.9
1	1-B	138	GLN	2.9
1	1-B	15	GLU	2.9
1	1-B	62	GLN	2.8
1	1-B	90	ASN	2.8
1	1-B	115	GLN	2.8
1	1-A	21	ALA	2.8
1	1-B	167	ASP	2.8
1	1-B	176	ILE	2.8

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Mol	Chain	Res	Type	RSRZ
1	1-A	56	SER	2.8
1	1-A	84	TRP	2.8
1	1-A	118	LYS	2.8
1	1-B	117	GLY	2.7
1	1-A	154	LEU	2.7
1	1-A	97	GLN	2.6
1	1-B	21	ALA	2.6
1	1-A	91	LEU	2.6
1	1-B	147	ALA	2.6
1	1-A	59	LYS	2.6
1	1-B	58	GLY	2.5
1	1-B	116	GLU	2.5
1	1-B	155	GLU	2.5
1	1-A	22	TYR	2.5
1	1-A	171	LYS	2.5
1	1-B	96	GLU	2.5
1	1-A	57	GLN	2.5
1	1-B	164	GLU	2.5
1	1-A	75	PRO	2.4
1	1-B	131	GLU	2.4
1	1-B	16	SER	2.4
1	1-A	175	GLU	2.3
1	1-B	169	THR	2.3
1	1-A	143	ILE	2.3
1	1-A	179	ILE	2.3
1	1-A	24	SER	2.2
1	1-A	62	GLN	2.2
1	1-A	101	LYS	2.2
1	1-B	159	LYS	2.2
1	1-A	37	SER	2.2
1	1-B	137	PRO	2.2
1	1-B	175	GLU	2.1
1	1-B	152	LEU	2.1
1	1-B	165	PRO	2.1
1	1-A	173	SER	2.1
1	1-A	99	GLY	2.1
1	1-B	173	SER	2.1
1	1-A	100	VAL	2.1
1	1-A	38	ALA	2.1
1	1-B	28	THR	2.0
1	1-A	88	LYS	2.0
1	1-A	168	TYR	2.0

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Mol	Chain	Res	Type	RSRZ
1	1-B	170	GLY	2.0
1	1-A	82	VAL	2.0
1	1-A	133	ALA	2.0
1	1-B	133	ALA	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.