



Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 11:34 PM GMT

PDB ID : 3TZ9
Title : Kinase domain of cSrc in complex with RL130
Authors : Gruetter, C.; Richters, A.; Rauh, D.
Deposited on : 2011-09-27
Resolution : 3.10 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

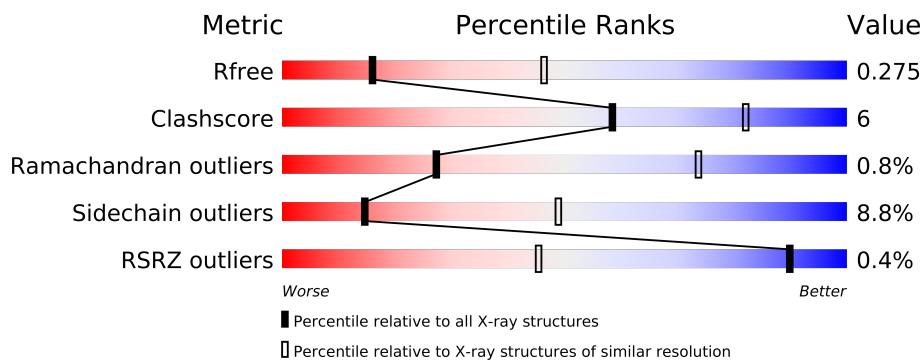
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

The reported resolution of this entry is 3.10 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}	66092	1007 (3.18-3.02)
Clashscore	79885	1078 (3.16-3.04)
Ramachandran outliers	78287	1044 (3.16-3.04)
Sidechain outliers	78261	1044 (3.16-3.04)
RSRZ outliers	66119	1008 (3.18-3.02)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	286	
1	B	286	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4268 atoms, of which 0 are hydrogen and 0 are deuterium.

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.

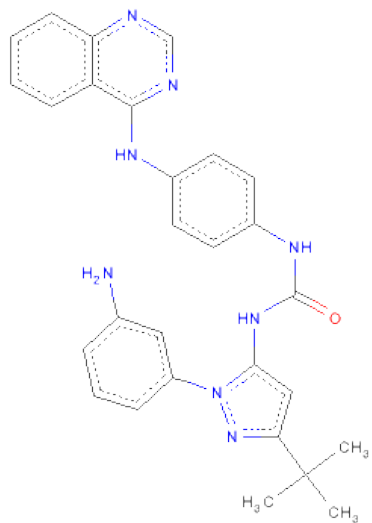
- Molecule 1 is a protein called Proto-oncogene tyrosine-protein kinase Src.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	261	Total	C	N	O	S	0	0	0
			2103	1351	350	384	18			
1	B	259	Total	C	N	O	S	0	0	0
			2091	1343	348	382	18			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	248	GLY	-	EXPRESSION TAG	UNP P00523
A	249	HIS	-	EXPRESSION TAG	UNP P00523
A	250	MET	-	EXPRESSION TAG	UNP P00523
A	345	CYS	SER	ENGINEERED MUTATION	UNP P00523
B	248	GLY	-	EXPRESSION TAG	UNP P00523
B	249	HIS	-	EXPRESSION TAG	UNP P00523
B	250	MET	-	EXPRESSION TAG	UNP P00523
B	345	CYS	SER	ENGINEERED MUTATION	UNP P00523

- Molecule 2 is 1-[1-(3-AMINOPHENYL)-3-TERT-BUTYL-1H-PYRAZOL-5-YL]-3-[4-(QUINAZOLIN-4-YLAMINO)PHENYL]UREA (three-letter code: AQU) (formula: C₂₈H₂₈N₈O).



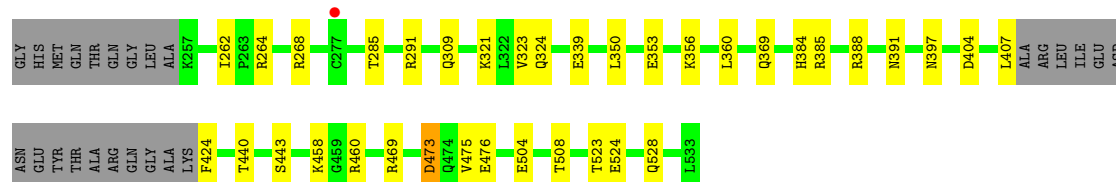
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			37	28	8	1		
2	B	1	Total	C	N	O	0	0
			37	28	8	1		

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

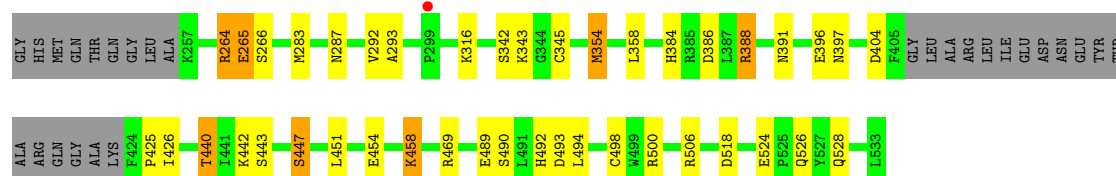
- Molecule 1: Proto-oncogene tyrosine-protein kinase Src

Chain A: 



- Molecule 1: Proto-oncogene tyrosine-protein kinase Src

Chain B: 



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	42.02Å 63.42Å 74.20Å 79.60° 87.89° 89.98°	Depositor
Resolution (Å)	41.99 – 3.10 41.99 – 3.10	Depositor EDS
% Data completeness (in resolution range)	100.0 (41.99-3.10) 91.9 (41.99-3.10)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.95 (at 3.12Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.211 , 0.283 0.209 , 0.275	Depositor DCC
R_{free} test set	815 reflections (6.95%)	DCC
Wilson B-factor (Å ²)	56.0	Xtriage
Anisotropy	0.458	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 30.9	EDS
Estimated twinning fraction	0.037 for h,-k,-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 12539 reflections	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4268	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.69% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: AQU

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	0.58	0/2155	0.66	0/2917
1	B	0.57	0/2143	0.66	0/2901
All	All	0.57	0/4298	0.66	0/5818

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2103	0	0	8	0
1	B	2091	0	0	18	0
2	A	37	0	28	2	0
2	B	37	0	28	3	0
All	All	4268	0	56	27	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 6.

All (27) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:442:LYS:NZ	1:B:506:ARG:O	2.19	0.75
1:B:500:ARG:O	1:B:506:ARG:NH1	2.29	0.65
1:B:264:ARG:CG	1:B:264:ARG:NH1	2.64	0.60
1:A:321:LYS:NZ	1:A:369:GLN:OE1	2.37	0.57
2:B:1:AQU:HAL	2:B:1:AQU:OAE	2.07	0.54
1:B:498:CYS:O	1:B:506:ARG:CD	2.57	0.53
1:A:388:ARG:O	1:A:391:ASN:N	2.43	0.52
1:B:358:LEU:O	1:B:458:LYS:NZ	2.45	0.50
1:B:447:SER:O	1:B:451:LEU:N	2.45	0.50
1:B:292:VAL:CG1	1:B:293:ALA:N	2.75	0.49
1:A:440:THR:O	1:A:443:SER:OG	2.31	0.48
1:B:266:SER:O	1:B:287:ASN:N	2.50	0.45
1:B:342:SER:OG	1:B:396:GLU:OE2	2.35	0.45
1:B:404:ASP:N	2:B:1:AQU:OAE	2.50	0.45
2:B:1:AQU:CAL	2:B:1:AQU:OAE	2.65	0.44
1:B:384:HIS:CE1	1:B:386:ASP:O	2.71	0.44
1:B:440:THR:O	1:B:443:SER:OG	2.36	0.43
1:A:339:GLU:O	2:A:1:AQU:H2	2.19	0.42
1:B:388:ARG:O	1:B:391:ASN:N	2.53	0.42
1:B:343:LYS:NZ	1:B:354:MET:CE	2.83	0.42
1:A:404:ASP:O	2:A:1:AQU:CAZ	2.68	0.42
1:A:460:ARG:NH1	1:B:518:ASP:CG	2.73	0.41
1:A:469:ARG:O	1:A:473:ASP:OD1	2.38	0.41
1:A:384:HIS:O	1:A:385:ARG:CB	2.68	0.41
1:B:489:GLU:O	1:B:492:HIS:N	2.54	0.41
1:B:493:ASP:O	1:B:494:LEU:C	2.59	0.41
1:B:386:ASP:OD2	1:B:388:ARG:NH2	2.54	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution. The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	257/286 (90%)	226 (88%)	30 (12%)	1 (0%)	43 84
1	B	255/286 (89%)	229 (90%)	23 (9%)	3 (1%)	19 62

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	512/572 (90%)	455 (89%)	53 (10%)	4 (1%)	27	74

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	265	GLU
1	B	425	PRO
1	A	353	GLU
1	B	490	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	227/245 (93%)	204 (90%)	23 (10%)	11	38
1	B	226/245 (92%)	209 (92%)	17 (8%)	19	58
All	All	453/490 (92%)	413 (91%)	40 (9%)	14	49

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	262	ILE
1	A	264	ARG
1	A	268	ARG
1	A	285	THR
1	A	291	ARG
1	A	309	GLN
1	A	323	VAL
1	A	324	GLN
1	A	350	LEU
1	A	356	LYS
1	A	360	LEU
1	A	397	ASN
1	A	407	LEU
1	A	424	PHE
1	A	458	LYS

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Mol	Chain	Res	Type
1	A	473	ASP
1	A	475	VAL
1	A	476	GLU
1	A	504	GLU
1	A	508	THR
1	A	523	THR
1	A	524	GLU
1	A	528	GLN
1	B	264	ARG
1	B	265	GLU
1	B	283	MET
1	B	316	LYS
1	B	345	CYS
1	B	354	MET
1	B	388	ARG
1	B	397	ASN
1	B	426	ILE
1	B	440	THR
1	B	447	SER
1	B	454	GLU
1	B	458	LYS
1	B	469	ARG
1	B	524	GLU
1	B	526	GLN
1	B	528	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

There are no RNA chains in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
2	AQU	A	1	-	41,41,41	2.22	11 (26%)	59,59,59	4.10	18 (30%)
2	AQU	B	1	-	41,41,41	2.26	9 (21%)	59,59,59	3.41	17 (28%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	AQU	A	1	-	-	0/20/22/22	0/3/5/5
2	AQU	B	1	-	-	0/20/22/22	0/3/5/5

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1	AQU	NAV-NBJ	-8.07	1.24	1.39
2	A	1	AQU	NAV-NBJ	-5.17	1.30	1.39
2	A	1	AQU	C2-N3	4.96	1.42	1.32
2	B	1	AQU	C2-N3	4.89	1.41	1.32
2	B	1	AQU	CAS-CBE	-4.83	1.33	1.39
2	A	1	AQU	CAS-CBE	-4.67	1.33	1.39
2	A	1	AQU	CBB-NAW	-4.66	1.32	1.41
2	B	1	AQU	CBD-NBJ	-4.33	1.34	1.43
2	B	1	AQU	C2-N1	4.14	1.42	1.33
2	A	1	AQU	C6-C5	-4.03	1.40	1.45
2	A	1	AQU	CBD-NBJ	-4.00	1.35	1.43
2	A	1	AQU	C2-N1	3.86	1.41	1.33
2	A	1	AQU	CBC-NAY	-3.33	1.33	1.40
2	B	1	AQU	CBB-NAW	-3.33	1.35	1.41
2	B	1	AQU	CBC-NAY	-3.20	1.33	1.40
2	B	1	AQU	C6-C5	-3.19	1.41	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1	AQU	CBF-NBJ	-3.00	1.34	1.36
2	A	1	AQU	CBF-NAX	-2.98	1.33	1.39
2	B	1	AQU	CBF-NAX	-2.27	1.35	1.39
2	A	1	AQU	CAZ-NAW	-2.06	1.33	1.37

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1	AQU	CAS-CBF-NBJ	22.58	110.12	106.68
2	B	1	AQU	CAS-CBF-NBJ	16.89	109.25	106.68
2	A	1	AQU	N3-C2-N1	-10.96	119.55	128.71
2	B	1	AQU	N3-C2-N1	-9.85	120.47	128.71
2	A	1	AQU	CBD-NBJ-NAV	8.61	125.51	118.85
2	B	1	AQU	CBD-NBJ-NAV	8.25	125.23	118.85
2	B	1	AQU	C6-C5-C4	7.46	119.88	115.63
2	A	1	AQU	C6-C5-C4	6.77	119.48	115.63
2	A	1	AQU	C2-N3-C4	6.42	120.33	115.37
2	A	1	AQU	C5-C6-NAY	-6.40	114.08	119.62
2	B	1	AQU	C2-N3-C4	5.53	119.65	115.37
2	A	1	AQU	NAY-C6-N1	5.42	124.45	118.92
2	A	1	AQU	CBK-CBE-NAV	4.76	125.64	120.64
2	B	1	AQU	NAY-C6-N1	4.03	123.03	118.92
2	B	1	AQU	C5-C6-NAY	-3.93	116.22	119.62
2	B	1	AQU	CBC-NAY-C6	-3.76	121.06	128.67
2	B	1	AQU	NAX-CBF-NBJ	3.72	124.79	120.99
2	A	1	AQU	C2-N1-C6	3.62	118.97	116.69
2	B	1	AQU	C2-N1-C6	3.58	118.94	116.69
2	B	1	AQU	CBK-CBE-NAV	3.57	124.38	120.64
2	A	1	AQU	CBC-NAY-C6	-3.46	121.67	128.67
2	A	1	AQU	CAK-CBD-CAR	-3.13	118.80	121.55
2	A	1	AQU	CAS-CBE-CBK	-3.13	125.10	128.94
2	A	1	AQU	CAQ-C5-C6	-2.98	119.57	123.94
2	A	1	AQU	CBF-NBJ-NAV	-2.83	107.00	110.97
2	B	1	AQU	CAS-CBE-CBK	-2.73	125.59	128.94
2	A	1	AQU	C5-C4-N3	-2.59	120.20	122.91
2	A	1	AQU	CAQ-C5-C4	2.57	120.94	118.32
2	B	1	AQU	C5-C4-N3	-2.50	120.30	122.91
2	B	1	AQU	CBE-NAV-NBJ	2.48	108.53	105.66
2	A	1	AQU	CBE-NAV-NBJ	2.38	108.42	105.66
2	B	1	AQU	CAQ-C5-C6	-2.37	120.46	123.94
2	B	1	AQU	CAK-CBD-CAR	-2.34	119.49	121.55
2	B	1	AQU	CBF-CAS-CBE	-2.34	103.84	106.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1	AQU	NAX-CBF-NBJ	2.30	123.34	120.99

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues

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	A	261/286 (91%)	-0.19	1 (0%) 90 45	19, 45, 86, 94	0
1	B	259/286 (90%)	-0.10	1 (0%) 90 45	21, 46, 105, 109	0
All	All	520/572 (90%)	-0.15	2 (0%) 90 45	19, 45, 102, 109	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	277	CYS	2.5
1	B	299	PRO	2.2

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(Å ²)	Q<0.9
2	AQU	B	1	37/37	0.24	0.33	69,70,72,72	0

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	AQU	A	1	37/37	0.19	-0.37	44,49,51,51	0

6.5 Other polymers ⓘ

There are no such residues in this entry.