



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 10:24 PM UTC

PDB ID : 6B2V / pdb_00006b2v
Title : Pyran synthase domain from module nine of the sorangicin pathway
Authors : Wagner, D.T.; Keatinge-Clay, A.T.
Deposited on : 2017-09-20
Resolution : 1.55 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	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

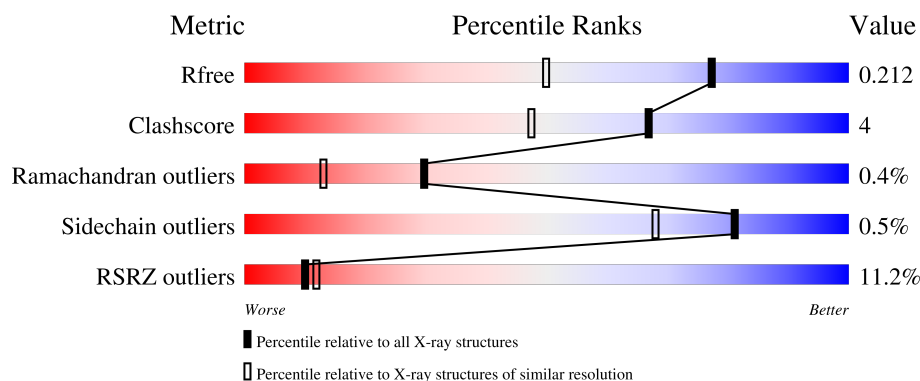
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.55 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	2145 (1.56-1.56)
Clashscore	190562	2189 (1.56-1.56)
Ramachandran outliers	187476	2153 (1.56-1.56)
Sidechain outliers	187428	2150 (1.56-1.56)
RSRZ outliers	180081	2146 (1.56-1.56)

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	301	10% 49% 38% • 11%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 2362 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 SorB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	267	Total	C	N	O	S	0	0	0
			2057	1293	375	381	8			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-24	MET	-	expression tag	UNP E5FNE5
A	-23	GLY	-	expression tag	UNP E5FNE5
A	-22	SER	-	expression tag	UNP E5FNE5
A	-21	SER	-	expression tag	UNP E5FNE5
A	-20	HIS	-	expression tag	UNP E5FNE5
A	-19	HIS	-	expression tag	UNP E5FNE5
A	-18	HIS	-	expression tag	UNP E5FNE5
A	-17	HIS	-	expression tag	UNP E5FNE5
A	-16	HIS	-	expression tag	UNP E5FNE5
A	-15	HIS	-	expression tag	UNP E5FNE5
A	-14	SER	-	expression tag	UNP E5FNE5
A	-13	SER	-	expression tag	UNP E5FNE5
A	-12	GLY	-	expression tag	UNP E5FNE5
A	-11	LEU	-	expression tag	UNP E5FNE5
A	-10	VAL	-	expression tag	UNP E5FNE5
A	-9	PRO	-	expression tag	UNP E5FNE5
A	-8	ARG	-	expression tag	UNP E5FNE5
A	-7	GLY	-	expression tag	UNP E5FNE5
A	-6	SER	-	expression tag	UNP E5FNE5
A	-5	HIS	-	expression tag	UNP E5FNE5

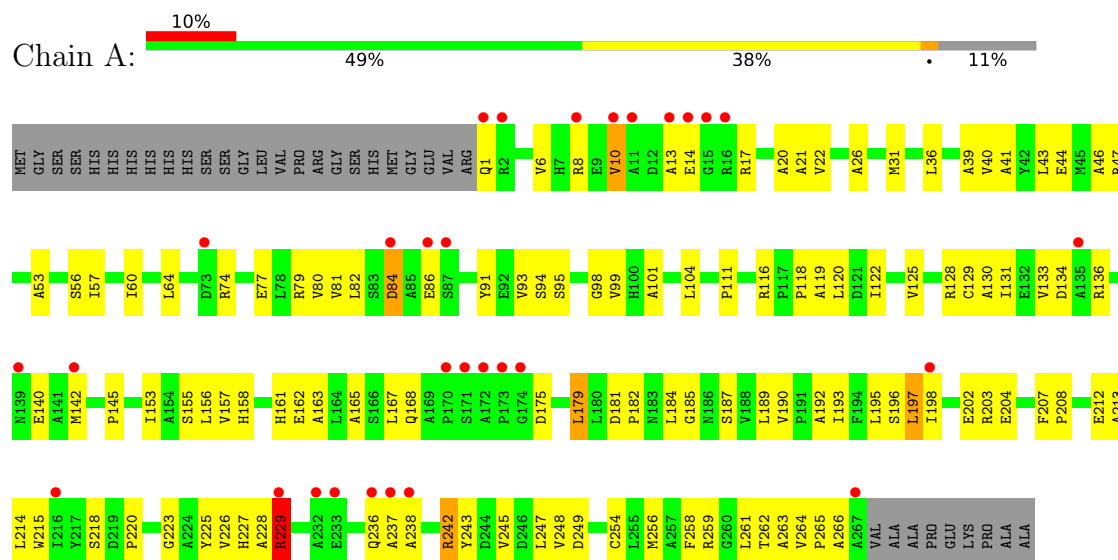
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	305	Total	O	0	0
			305	305		

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: SorB



4 Data and refinement statistics

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, α , β , γ	75.37Å 75.37Å 195.87Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 1.55 30.00 – 1.55	Depositor EDS
% Data completeness (in resolution range)	96.8 (30.00-1.55) 96.8 (30.00-1.55)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.91 (at 1.55Å)	Xtriage
Refinement program	REFMAC 5.8.0151	Depositor
R, R_{free}	0.204 , 0.212 0.204 , 0.212	Depositor DCC
R_{free} test set	2363 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å ²)	16.3	Xtriage
Anisotropy	0.001	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 36.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	2362	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.18% 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	2.10	101/2105 (4.8%)	1.22	12/2866 (0.4%)

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	3

All (101) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	264	VAL	C-O	-10.83	1.15	1.24
1	A	60	ILE	C-O	-10.00	1.14	1.24
1	A	245	VAL	C-O	-8.29	1.15	1.24
1	A	227	HIS	C-O	-7.88	1.15	1.24
1	A	247	LEU	C-O	-7.71	1.14	1.24
1	A	129	CYS	C-O	-7.63	1.15	1.23
1	A	215	TRP	C-O	-7.52	1.15	1.24
1	A	242	ARG	C-O	-7.50	1.14	1.24
1	A	22	VAL	C-O	-7.46	1.15	1.24
1	A	258	PHE	C-O	-7.42	1.15	1.24
1	A	185	GLY	C-O	-7.29	1.15	1.23
1	A	262	THR	C-O	-7.12	1.16	1.24
1	A	218	SER	C-O	-7.06	1.16	1.23
1	A	133	VAL	C-O	-7.05	1.16	1.23
1	A	196	SER	C-O	-6.99	1.16	1.24
1	A	248	VAL	C-O	-6.90	1.16	1.23
1	A	184	LEU	C-O	-6.87	1.16	1.24
1	A	226	VAL	C-O	-6.86	1.16	1.24
1	A	156	LEU	C-O	-6.79	1.16	1.23
1	A	119	ALA	C-O	-6.78	1.15	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	208	PRO	C-O	-6.72	1.15	1.23
1	A	213	ALA	C-O	-6.70	1.15	1.23
1	A	157	VAL	C-O	-6.55	1.17	1.24
1	A	158	HIS	C-O	-6.54	1.16	1.23
1	A	104	LEU	C-O	-6.54	1.16	1.24
1	A	122	ILE	C-O	-6.36	1.16	1.24
1	A	165	ALA	C-O	-6.36	1.16	1.24
1	A	6	VAL	C-O	-6.33	1.16	1.24
1	A	82	LEU	C-O	-6.25	1.16	1.24
1	A	43	LEU	C-O	-6.21	1.16	1.24
1	A	64	LEU	C-O	-6.15	1.16	1.23
1	A	238	ALA	C-O	-6.15	1.16	1.24
1	A	265	PRO	C-O	-6.10	1.16	1.23
1	A	21	ALA	C-O	-6.07	1.16	1.23
1	A	259	ARG	C-O	-6.04	1.16	1.24
1	A	94	SER	C-O	-6.04	1.16	1.23
1	A	145	PRO	C-O	-6.02	1.17	1.24
1	A	243	TYR	C-O	-5.99	1.16	1.23
1	A	10	VAL	C-O	-5.99	1.18	1.24
1	A	263	ALA	C-O	-5.99	1.16	1.24
1	A	229	ARG	C-O	-5.97	1.16	1.24
1	A	93	VAL	C-O	-5.96	1.17	1.24
1	A	56	SER	C-O	-5.96	1.17	1.24
1	A	118	PRO	C-O	-5.93	1.16	1.23
1	A	197	LEU	C-N	5.92	1.40	1.33
1	A	256	MET	C-O	-5.92	1.16	1.23
1	A	153	ILE	C-O	-5.91	1.18	1.24
1	A	116	ARG	C-O	-5.91	1.16	1.24
1	A	249	ASP	C-O	-5.91	1.17	1.23
1	A	84	ASP	C-O	-5.89	1.16	1.23
1	A	77	GLU	C-O	-5.88	1.16	1.23
1	A	95	SER	C-O	-5.86	1.17	1.23
1	A	187	SER	C-O	-5.82	1.17	1.24
1	A	203	ARG	C-O	-5.82	1.16	1.24
1	A	36	LEU	C-O	-5.80	1.17	1.24
1	A	192	ALA	C-O	-5.78	1.17	1.24
1	A	155	SER	C-O	-5.73	1.17	1.23
1	A	163	ALA	C-O	-5.72	1.16	1.23
1	A	204	GLU	C-O	-5.71	1.17	1.23
1	A	80	VAL	C-O	-5.69	1.18	1.24
1	A	46	ALA	C-O	-5.67	1.17	1.24
1	A	128	ARG	C-O	-5.67	1.16	1.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	161	HIS	C-O	-5.67	1.16	1.24
1	A	101	ALA	C-O	-5.66	1.16	1.23
1	A	266	ALA	C-O	-5.64	1.16	1.23
1	A	182	PRO	C-O	-5.64	1.17	1.24
1	A	190	VAL	CA-CB	5.61	1.57	1.53
1	A	125	VAL	C-O	-5.60	1.17	1.24
1	A	134	ASP	C-O	-5.60	1.16	1.23
1	A	181	ASP	C-O	-5.59	1.17	1.24
1	A	98	GLY	C-O	-5.57	1.18	1.23
1	A	162	GLU	C-O	-5.57	1.17	1.23
1	A	44	GLU	C-O	-5.55	1.17	1.24
1	A	41	ALA	C-O	-5.53	1.17	1.24
1	A	79	ARG	C-O	-5.49	1.17	1.24
1	A	189	LEU	C-O	-5.46	1.17	1.24
1	A	261	LEU	C-O	-5.44	1.17	1.24
1	A	99	VAL	C-O	-5.41	1.17	1.24
1	A	202	GLU	C-O	-5.41	1.17	1.23
1	A	167	LEU	C-O	-5.40	1.17	1.23
1	A	91	TYR	C-O	-5.39	1.17	1.23
1	A	214	LEU	C-O	-5.35	1.18	1.24
1	A	53	ALA	C-O	-5.35	1.17	1.24
1	A	17	ARG	C-O	-5.31	1.17	1.23
1	A	57	ILE	C-O	-5.30	1.18	1.24
1	A	81	VAL	C-O	-5.25	1.18	1.24
1	A	220	PRO	C-O	-5.24	1.17	1.24
1	A	40	VAL	C-O	-5.23	1.17	1.24
1	A	195	LEU	C-O	-5.16	1.18	1.24
1	A	254	CYS	C-O	-5.16	1.17	1.24
1	A	131	ILE	C-O	-5.13	1.18	1.24
1	A	225	TYR	C-O	-5.12	1.17	1.23
1	A	39	ALA	C-O	-5.11	1.18	1.24
1	A	111	PRO	C-O	-5.09	1.17	1.23
1	A	20	ALA	C-O	-5.04	1.17	1.23
1	A	193	ILE	C-O	-5.03	1.18	1.24
1	A	207	PHE	C-O	-5.03	1.17	1.24
1	A	120	LEU	C-O	-5.03	1.17	1.24
1	A	140	GLU	C-O	-5.03	1.18	1.24
1	A	130	ALA	C-O	-5.02	1.17	1.24
1	A	86	GLU	C-O	-5.02	1.18	1.24

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	238	ALA	N-CA-C	9.80	124.86	109.07
1	A	197	LEU	CA-C-N	-9.05	105.80	120.64
1	A	197	LEU	C-N-CA	-9.05	105.80	120.64
1	A	14	GLU	N-CA-C	9.03	123.93	111.74
1	A	237	ALA	N-CA-C	-8.52	99.91	110.65
1	A	175	ASP	N-CA-C	-8.08	97.84	109.96
1	A	130	ALA	N-CA-C	6.12	120.48	112.89
1	A	223	GLY	N-CA-C	5.93	118.30	111.36
1	A	179	LEU	N-CA-C	-5.92	103.60	111.24
1	A	236	GLN	N-CA-C	5.85	123.26	110.80
1	A	133	VAL	N-CA-C	5.07	117.32	108.95
1	A	13	ALA	N-CA-C	5.04	117.51	109.81

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	198	ILE	Mainchain
1	A	228	ALA	Mainchain
1	A	229	ARG	Mainchain

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	2057	0	2008	15	0
2	A	305	0	0	10	4
All	All	2362	0	2008	15	4

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 4.

All (15) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:212:GLU:OE1	1:A:242:ARG:NH2	1.64	1.29

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:8:ARG:NH2	2:A:302:HOH:O	1.88	1.06
1:A:212:GLU:OE2	2:A:301:HOH:O	1.84	0.93
1:A:74:ARG:HG2	2:A:429:HOH:O	1.83	0.78
1:A:168:GLN:OE1	2:A:303:HOH:O	2.03	0.77
1:A:168:GLN:OE1	2:A:305:HOH:O	2.10	0.69
1:A:84:ASP:O	2:A:306:HOH:O	2.11	0.67
1:A:212:GLU:OE1	1:A:242:ARG:CZ	2.45	0.62
1:A:1:GLN:HG2	2:A:317:HOH:O	2.09	0.53
1:A:1:GLN:CG	2:A:317:HOH:O	2.58	0.51
1:A:74:ARG:NH2	2:A:304:HOH:O	2.07	0.51
1:A:26:ALA:O	1:A:31:MET:HE2	2.11	0.50
1:A:142:MET:SD	1:A:197:LEU:HD13	2.56	0.46
1:A:47:ARG:HD2	1:A:179:LEU:HD23	2.00	0.43
1:A:136:ARG:NH1	2:A:308:HOH:O	2.31	0.43

All (4) 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)
2:A:557:HOH:O	2:A:601:HOH:O[12_555]	1.59	0.61
2:A:484:HOH:O	2:A:538:HOH:O[12_555]	2.01	0.19
2:A:317:HOH:O	2:A:440:HOH:O[5_564]	2.04	0.16
2:A:562:HOH:O	2:A:594:HOH:O[7_555]	2.17	0.03

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	265/301 (88%)	257 (97%)	7 (3%)	1 (0%)	30 13

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	229	ARG

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	205/231 (89%)	204 (100%)	1 (0%)	81 68

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	139	ASN
1	A	186	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

There are no ligands in this entry.

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 [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	267/301 (88%)	0.60	30 (11%)	10 12	9, 20, 38, 49	0

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	237	ALA	7.1
1	A	15	GLY	6.5
1	A	1	GLN	6.0
1	A	267	ALA	4.4
1	A	238	ALA	4.2
1	A	13	ALA	4.1
1	A	174	GLY	3.7
1	A	135	ALA	3.5
1	A	8	ARG	3.5
1	A	14	GLU	3.5
1	A	172	ALA	3.3
1	A	236	GLN	3.1
1	A	171	SER	2.9
1	A	86	GLU	2.7
1	A	10	VAL	2.6
1	A	11	ALA	2.6
1	A	73	ASP	2.6
1	A	87	SER	2.5
1	A	198	ILE	2.5
1	A	229	ARG	2.5
1	A	84	ASP	2.5
1	A	173	PRO	2.4
1	A	233	GLU	2.4
1	A	170	PRO	2.4
1	A	142	MET	2.4
1	A	16	ARG	2.2
1	A	216	ILE	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	2	ARG	2.1
1	A	139	ASN	2.1
1	A	232	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.