



Full wwPDB X-ray Structure Validation Report

Feb 27, 2014 – 06:49 AM GMT

PDB ID : 3PSF
Title : Crystal Structure of the Spt6 core domain from *Saccharomyces cerevisiae*,
Form Spt6(236-1259)
Authors : Close, D.; Hill, C.P.
Deposited on : 2010-12-01
Resolution : 2.59 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>

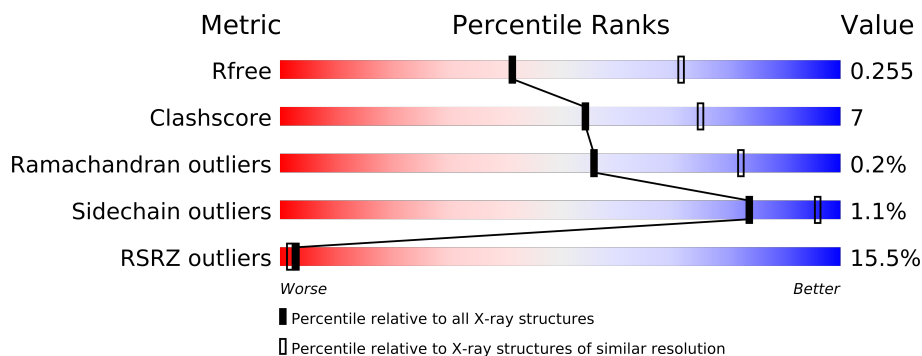
The following versions of software and data (see [references](#)) were used in the production of this report:

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 2.59 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	1718 (2.60-2.60)
Clashscore	79885	2154 (2.60-2.60)
Ramachandran outliers	78287	2113 (2.60-2.60)
Sidechain outliers	78261	2113 (2.60-2.60)
RSRZ outliers	66119	1718 (2.60-2.60)

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	1030	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13444 atoms, of which 6655 are hydrogens 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 Transcription elongation factor SPT6.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	826	Total	C	H	N	O	S	0	0	0
			13396	4272	6655	1134	1317	18			

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	230	GLY	-	EXPRESSION TAG	UNP P23615
A	231	ILE	-	EXPRESSION TAG	UNP P23615
A	232	ASP	-	EXPRESSION TAG	UNP P23615
A	233	PRO	-	EXPRESSION TAG	UNP P23615
A	234	PHE	-	EXPRESSION TAG	UNP P23615

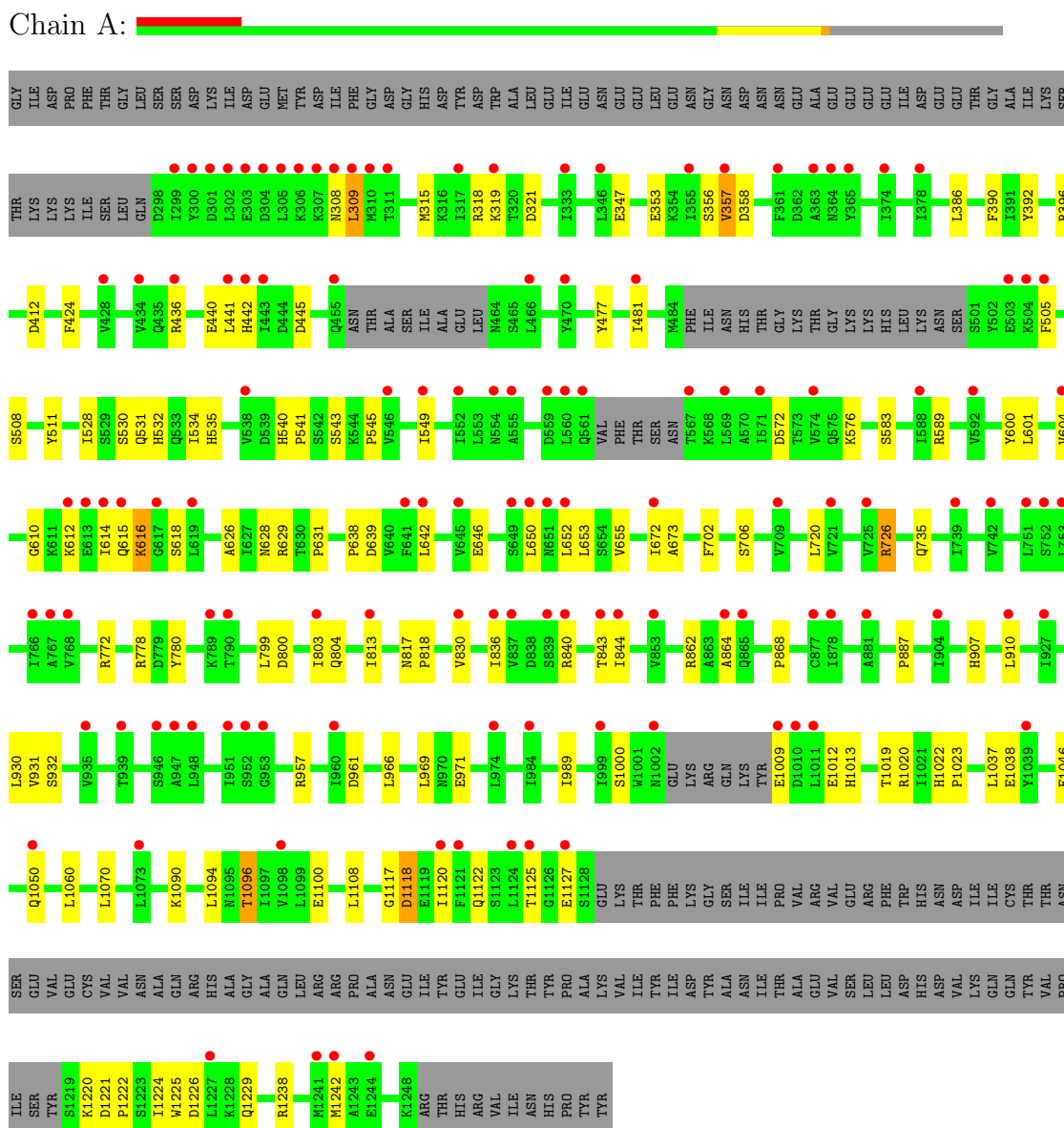
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	48	Total	O	0	0
			48	48		

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: Transcription elongation factor SPT6



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	115.05Å 116.18Å 117.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.32 – 2.59 32.32 – 2.59	Depositor EDS
% Data completeness (in resolution range)	96.5 (32.32-2.59) 96.0 (32.32-2.59)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.21 (at 2.57Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.4_486)	Depositor
R, R_{free}	0.224 , 0.265 0.211 , 0.255	Depositor DCC
R_{free} test set	1910 reflections (4.00%)	DCC
Wilson B-factor (Å ²)	65.1	Xtriage
Anisotropy	0.581	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 55.7	EDS
Estimated twinning fraction	0.020 for -h,l,k 0.017 for -l,-k,-h 0.016 for k,h,-l 0.007 for k,l,h 0.007 for l,h,k	Xtriage
L-test for twinning	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	1 of 49536 reflections (0.002%)	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	13444	wwPDB-VP
Average B, all atoms (Å ²)	103.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

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	0.33	0/6869	0.48	0/9278

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	6741	6655	0	91	0
2	A	48	0	0	2	0
All	All	6789	6655	0	91	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 7.

All (91) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:626:ALA:HB1	1:A:629:ARG:HE	1.61	0.65
1:A:357:VAL:HG12	1:A:358:ASP:N	2.16	0.60
1:A:615:GLN:O	1:A:616:LYS:HB2	2.02	0.60
1:A:532:HIS:NE2	1:A:534:ILE:HG22	2.16	0.59

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:412:ASP:OD1	1:A:726:ARG:NH1	2.35	0.59
1:A:817:ASN:HB2	1:A:818:PRO:CD	2.33	0.59
1:A:347:GLU:HB2	1:A:424:PHE:CE2	2.38	0.58
1:A:615:GLN:O	1:A:616:LYS:CB	2.51	0.57
1:A:629:ARG:NH1	1:A:1224:ILE:HB	2.19	0.57
1:A:347:GLU:HG3	1:A:424:PHE:CG	2.41	0.56
1:A:1009:GLU:N	1:A:1012:GLU:HG2	2.22	0.55
1:A:817:ASN:HB2	1:A:818:PRO:HD2	1.89	0.55
1:A:1046:GLU:O	1:A:1050:GLN:HG2	2.07	0.55
1:A:530:SER:O	1:A:531:GLN:HB2	2.08	0.53
1:A:864:ALA:O	1:A:868:PRO:HA	2.08	0.53
1:A:347:GLU:HG3	1:A:424:PHE:CD2	2.45	0.52
1:A:604:VAL:HG13	1:A:653:LEU:HD22	1.92	0.52
1:A:800:ASP:O	1:A:804:GLN:HG2	2.10	0.52
1:A:803:ILE:HG21	1:A:836:ILE:HG21	1.93	0.51
1:A:650:LEU:HB3	1:A:652:LEU:HD13	1.93	0.51
1:A:655:VAL:HG13	1:A:655:VAL:O	2.10	0.51
1:A:610:GLY:O	1:A:614:ILE:HG12	2.11	0.51
1:A:1019:THR:HB	1:A:1100:GLU:HB3	1.91	0.51
1:A:534:ILE:HG13	1:A:535:HIS:CD2	2.46	0.50
1:A:638:PRO:HB3	1:A:720:LEU:HD12	1.92	0.50
1:A:441:LEU:HD21	1:A:481:ILE:HG22	1.95	0.49
1:A:511:TYR:O	1:A:511:TYR:CD2	2.66	0.49
1:A:1118:ASP:OD1	1:A:1118:ASP:N	2.45	0.49
1:A:735:GLN:HB3	1:A:887:PRO:HG2	1.94	0.48
1:A:604:VAL:CG1	1:A:653:LEU:HD22	2.43	0.48
1:A:318:ARG:HD3	1:A:961:ASP:HB2	1.95	0.48
1:A:392:TYR:CE2	1:A:396:ARG:NH2	2.82	0.48
1:A:612:LYS:O	1:A:615:GLN:HG2	2.13	0.47
1:A:969:LEU:O	1:A:971:GLU:HG2	2.13	0.47
1:A:646:GLU:O	1:A:650:LEU:HG	2.15	0.47
1:A:545:PRO:O	1:A:549:ILE:HG12	2.14	0.47
1:A:1090:LYS:O	1:A:1094:LEU:HG	2.15	0.47
1:A:583:SER:O	1:A:589:ARG:HD2	2.14	0.47
1:A:445:ASP:HB2	1:A:477:TYR:OH	2.15	0.47
1:A:650:LEU:CB	1:A:652:LEU:HD13	2.45	0.46
1:A:1221:ASP:OD1	1:A:1222:PRO:HD2	2.15	0.46
1:A:600:TYR:CE1	1:A:631:PRO:HG3	2.51	0.46
1:A:601:LEU:HB3	1:A:628:ASN:HA	1.96	0.46
1:A:1117:GLY:HA2	1:A:1120:ILE:HD12	1.98	0.46
1:A:843:THR:HG22	2:A:29:HOH:O	2.15	0.45
1:A:642:LEU:HB2	1:A:910:LEU:HD13	1.98	0.45

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:1020:ARG:NH2	1:A:1108:LEU:HG	2.31	0.45
1:A:642:LEU:CB	1:A:910:LEU:HD13	2.47	0.45
1:A:1125:THR:HG22	1:A:1127:GLU:H	1.81	0.45
1:A:1220:LYS:HA	1:A:1225:TRP:CG	2.52	0.44
1:A:441:LEU:O	1:A:442:HIS:HB3	2.17	0.44
1:A:639:ASP:HB2	1:A:907:HIS:NE2	2.32	0.44
1:A:353:GLU:O	1:A:356:SER:HB3	2.17	0.44
1:A:308:ASN:O	1:A:309:LEU:HB2	2.18	0.44
1:A:540:HIS:HD2	1:A:543:SER:H	1.66	0.44
1:A:540:HIS:HA	1:A:541:PRO:HD3	1.91	0.44
1:A:572:ASP:O	1:A:576:LYS:HG3	2.18	0.44
1:A:436:ARG:O	1:A:440:GLU:HB2	2.17	0.44
1:A:1096:THR:O	1:A:1100:GLU:HG2	2.18	0.43
1:A:702:PHE:O	1:A:706:SER:HB2	2.18	0.43
1:A:772:ARG:CZ	1:A:772:ARG:HB2	2.49	0.43
1:A:799:LEU:HD23	1:A:830:VAL:HG11	2.00	0.43
1:A:1037:LEU:HD21	1:A:1060:LEU:HD12	2.00	0.43
1:A:650:LEU:O	1:A:652:LEU:HD12	2.19	0.43
1:A:930:LEU:O	1:A:1020:ARG:NH1	2.52	0.43
1:A:1125:THR:CG2	1:A:1127:GLU:HG3	2.49	0.43
1:A:840:ARG:O	1:A:840:ARG:HG3	2.19	0.42
1:A:653:LEU:HD12	1:A:653:LEU:C	2.40	0.42
1:A:1037:LEU:O	1:A:1038:GLU:HB2	2.19	0.42
1:A:1238:ARG:NH1	1:A:1242:MET:SD	2.92	0.42
1:A:390:PHE:CD2	1:A:390:PHE:C	2.92	0.42
1:A:386:LEU:HD13	1:A:390:PHE:CE2	2.55	0.42
1:A:966:LEU:HD23	1:A:966:LEU:HA	1.86	0.42
1:A:799:LEU:HD23	1:A:830:VAL:CG1	2.50	0.41
1:A:505:PHE:O	1:A:508:SER:HB3	2.19	0.41
1:A:862:ARG:NH2	2:A:47:HOH:O	2.53	0.41
1:A:309:LEU:HB3	1:A:957:ARG:HG2	2.02	0.41
1:A:321:ASP:OD1	1:A:989:ILE:HG12	2.20	0.41
1:A:315:MET:O	1:A:319:LYS:HG2	2.21	0.41
1:A:615:GLN:O	1:A:616:LYS:HG3	2.20	0.41
1:A:1060:LEU:HD21	1:A:1070:LEU:HD11	2.03	0.41
1:A:931:VAL:O	1:A:932:SER:HB2	2.21	0.41
1:A:672:ILE:CG2	1:A:672:ILE:O	2.67	0.41
1:A:1226:ASP:CG	1:A:1229:GLN:HB2	2.41	0.41
1:A:528:ILE:HG13	1:A:673:ALA:HB2	2.03	0.41
1:A:836:ILE:HG22	1:A:844:ILE:HD12	2.02	0.40
1:A:600:TYR:CZ	1:A:631:PRO:HG3	2.56	0.40
1:A:778:ARG:HD3	1:A:780:TYR:CZ	2.56	0.40

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:1122:GLN:HG2	1:A:1127:GLU:O	2.22	0.40
1:A:639:ASP:HB2	1:A:907:HIS:CD2	2.56	0.40
1:A:1022:HIS:ND1	1:A:1023:PRO:HD2	2.37	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	814/1030 (79%)	772 (95%)	40 (5%)	2 (0%)	56 82

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	616	LYS
1	A	357	VAL

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	748/929 (80%)	740 (99%)	8 (1%)	84 96

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	309	LEU
1	A	618	SER
1	A	726	ARG

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Mol	Chain	Res	Type
1	A	813	ILE
1	A	1000	SER
1	A	1013	HIS
1	A	1096	THR
1	A	1118	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	344	GLN
1	A	425	HIS
1	A	467	GLN
1	A	540	HIS
1	A	575	GLN
1	A	628	ASN
1	A	678	ASN
1	A	696	GLN
1	A	893	ASN
1	A	1013	HIS
1	A	1092	ASN
1	A	1093	ASN
1	A	1110	ASN

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 ⓘ

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 ⓘ

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	826/1030 (80%)	0.86	128 (15%) 3 2	59, 90, 148, 201	0

All (128) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	481	ILE	6.8
1	A	299	ILE	6.3
1	A	560	LEU	6.2
1	A	1011	LEU	5.9
1	A	619	LEU	5.8
1	A	651	ASN	5.3
1	A	302	LEU	5.3
1	A	571	ILE	5.2
1	A	836	ILE	5.1
1	A	504	LYS	5.1
1	A	300	TYR	4.9
1	A	649	SER	4.8
1	A	615	GLN	4.7
1	A	1010	ASP	4.5
1	A	303	GLU	4.4
1	A	443	ILE	4.3
1	A	305	LEU	4.2
1	A	652	LEU	4.1
1	A	333	ILE	4.0
1	A	559	ASP	3.8
1	A	742	VAL	3.8
1	A	1009	GLU	3.8
1	A	641	PHE	3.7
1	A	839	SER	3.7
1	A	1121	PHE	3.7
1	A	442	HIS	3.6
1	A	304	ASP	3.6

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Mol	Chain	Res	Type	RSRZ
1	A	1242	MET	3.5
1	A	365	TYR	3.4
1	A	306	LYS	3.4
1	A	877	CYS	3.4
1	A	567	THR	3.4
1	A	364	ASN	3.3
1	A	904	ILE	3.3
1	A	363	ALA	3.3
1	A	830	VAL	3.3
1	A	554	ASN	3.2
1	A	436	ARG	3.2
1	A	549	ILE	3.2
1	A	538	VAL	3.1
1	A	974	LEU	3.1
1	A	428	VAL	3.1
1	A	310	MET	3.1
1	A	1244	GLU	3.1
1	A	1241	MET	3.0
1	A	470	TYR	3.0
1	A	552	ILE	2.9
1	A	555	ALA	2.9
1	A	843	THR	2.9
1	A	927	ILE	2.9
1	A	503	GLU	2.9
1	A	317	ILE	2.9
1	A	434	VAL	2.9
1	A	721	VAL	2.8
1	A	309	LEU	2.8
1	A	790	THR	2.8
1	A	1073	LEU	2.8
1	A	1124	LEU	2.8
1	A	960	ILE	2.7
1	A	939	THR	2.7
1	A	311	THR	2.7
1	A	378	ILE	2.7
1	A	592	VAL	2.7
1	A	878	ILE	2.7
1	A	642	LEU	2.7
1	A	840	ARG	2.7
1	A	952	SER	2.7
1	A	803	ILE	2.6
1	A	308	ASN	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	505	PHE	2.6
1	A	837	VAL	2.6
1	A	561	GLN	2.6
1	A	767	ALA	2.6
1	A	881	ALA	2.6
1	A	953	GLY	2.6
1	A	301	ASP	2.6
1	A	844	ILE	2.6
1	A	999	ILE	2.6
1	A	346	LEU	2.5
1	A	466	LEU	2.5
1	A	725	VAL	2.5
1	A	789	LYS	2.5
1	A	1002	ASN	2.5
1	A	612	LYS	2.5
1	A	935	VAL	2.5
1	A	752	SER	2.4
1	A	355	ILE	2.4
1	A	357	VAL	2.4
1	A	1125	THR	2.4
1	A	1050	GLN	2.4
1	A	645	VAL	2.4
1	A	374	ILE	2.4
1	A	709	VAL	2.4
1	A	864	ALA	2.4
1	A	1039	TYR	2.4
1	A	766	ILE	2.4
1	A	307	LYS	2.3
1	A	1127	GLU	2.3
1	A	1120	ILE	2.3
1	A	1098	VAL	2.3
1	A	604	VAL	2.3
1	A	672	ILE	2.3
1	A	739	ILE	2.3
1	A	910	LEU	2.2
1	A	1227	LEU	2.2
1	A	574	VAL	2.2
1	A	361	PHE	2.2
1	A	546	VAL	2.2
1	A	441	LEU	2.2
1	A	853	VAL	2.2
1	A	614	ILE	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	865	GLN	2.2
1	A	588	ILE	2.2
1	A	751	LEU	2.2
1	A	947	ALA	2.2
1	A	946	SER	2.1
1	A	569	LEU	2.1
1	A	951	ILE	2.1
1	A	984	ILE	2.1
1	A	948	LEU	2.1
1	A	455	GLN	2.1
1	A	613	GLU	2.1
1	A	768	VAL	2.1
1	A	650	LEU	2.0
1	A	617	GLY	2.0
1	A	753	LEU	2.0
1	A	319	LYS	2.0
1	A	813	ILE	2.0

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 ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.