



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 16, 2024 – 05:11 PM EDT

PDB ID : 3PSI  
Title : Crystal Structure of the Spt6 core domain from *Saccharomyces cerevisiae*,  
Form Spt6(239-1451)  
Authors : Close, D.; Hill, C.P.; Johnson, S.J.  
Deposited on : 2010-12-01  
Resolution : 3.30 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](mailto: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>.

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

MolProbity : 4.02b-467  
Xtriage (Phenix) : 1.20.1  
EDS : 2.37.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

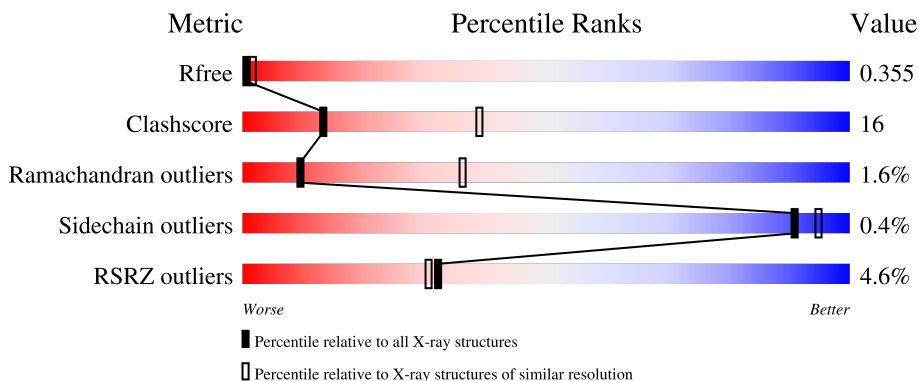
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.30 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))
$R_{free}$	130704	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)

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  $\geq 3$ , 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	1219	

## 2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 13677 atoms, of which 6800 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 Transcription elongation factor SPT6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	843	13677	4370	6800	1164	1326	17	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	233	GLY	-	EXPRESSION TAG	UNP P23615
A	234	ILE	-	EXPRESSION TAG	UNP P23615
A	235	ASP	-	EXPRESSION TAG	UNP P23615
A	236	PRO	-	EXPRESSION TAG	UNP P23615
A	237	PHE	-	EXPRESSION TAG	UNP P23615
A	238	THR	-	EXPRESSION TAG	UNP P23615



LYS	ASP
VAL	PRO
ILE	GLN
ARG	SER
GLN	ILE
SER	TRP
ARG	ASP
GLY	LEU
ASP	LYS
GLN	GLN
ASP	GLU
HIS	LEU
GLU	LEU
GLU	ASP
ALA	ALA
THR	GLU
GLU	GLU
ARG	ARG
LYS	LYS
LEU	LEU
LEU	MET
ASP	MET
LEU	ALA
GLN	GLU
ALA	ALA
ARG	ARG
ILE	ILE
ILE	ALA
LYS	LYS
GLN	GLN
ARG	ARG
THR	THR
HIS	HIS
ARG	ARG
VAL	VAL
ILE	ILE
ASP	ASP
GLN	GLN
ILE	ILE
ALA	ALA
GLY	GLY
LYS	LYS
VAL	VAL
PRO	PRO
PHE	PHE
ASN	ASN
GLY	GLY
ARG	ARG
VAL	VAL
ASN	ASN
GLN	GLN
ALA	ALA
GLU	GLU
TYR	TYR
ASN	ASN
TYR	TYR
ILE	ILE
VAL	VAL
ASP	ASP
ARG	ARG
LEU	LEU
LEU	LEU
LEU	LEU
ASN	ASN
GLU	GLU
MET	MET
THR	THR
SER	SER
SER	SER
GLU	GLU
LYS	LYS
PHE	PHE
THR	THR
GLY	GLY
TYR	TYR
PHE	PHE
LEU	LEU
VAL	VAL
THR	THR
ASN	ASN
THR	THR
GLY	GLY
TYR	TYR
PHE	PHE
LEU	LEU
VAL	VAL
THR	THR
ASN	ASN
TYR	TYR
GLN	GLN
GLN	GLN
LEU	LEU
CYS	CYS
ASN	ASN
GLY	GLY
PHE	PHE
LYS	LYS
THR	THR
LEU	LEU
LEU	LEU
LYS	LYS
SER	SER
ASN	ASN
SER	SER
SER	SER
LYS	LYS
ASN	ASN
ARG	ARG
MET	MET
ASN	ASN
ASN	ASN
TYR	TYR
ARG	ARG

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	118.75Å 118.75Å 214.41Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	45.67 – 3.30 45.67 – 3.29	Depositor EDS
% Data completeness (in resolution range)	99.4 (45.67-3.30) 99.4 (45.67-3.29)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.44 (at 3.32Å)	Xtrriage
Refinement program	PHENIX 1.6.4_486	Depositor
R, $R_{free}$	0.265 , 0.308 0.259 , 0.355	Depositor DCC
$R_{free}$ test set	2836 reflections (10.50%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	111.6	Xtrriage
Anisotropy	0.000	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 136.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.017 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	13677	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	170.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.75% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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	0.62	0/7015	0.77	2/9487 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1020	ARG	NE-CZ-NH1	-7.92	116.34	120.30
1	A	1101	LEU	CB-CG-CD1	-5.88	101.00	111.00

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	A	6877	6800	6777	221	0
All	All	6877	6800	6777	221	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 16.

All (221) 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:980:ILE:HD12	1:A:981:THR:N	1.84	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:601:LEU:HD11	1:A:658:HIS:HB2	1.61	0.83
1:A:980:ILE:HD12	1:A:981:THR:H	1.41	0.81
1:A:641:PHE:CE1	1:A:713:LEU:HD23	2.21	0.75
1:A:653:LEU:HD12	1:A:653:LEU:C	2.07	0.74
1:A:540:HIS:CE1	1:A:543:SER:HB3	2.24	0.73
1:A:475:PHE:CE1	1:A:580:LEU:CD1	2.72	0.72
1:A:598:LYS:HG3	1:A:599:TYR:CD2	2.25	0.71
1:A:435:GLN:HB2	1:A:452:PHE:CE1	2.27	0.70
1:A:890:GLU:OE2	1:A:890:GLU:HA	1.90	0.70
1:A:1029:ALA:O	1:A:1032:VAL:HG22	1.93	0.69
1:A:1125:THR:HG22	1:A:1127:GLU:HB2	1.75	0.69
1:A:394:TYR:CE1	1:A:1022:HIS:HB2	2.28	0.69
1:A:614:ILE:HG21	1:A:624:LYS:HD2	1.75	0.68
1:A:642:LEU:HB3	1:A:910:LEU:HD13	1.74	0.68
1:A:934:GLU:HG3	1:A:937:LYS:H	1.57	0.68
1:A:1125:THR:CG2	1:A:1127:GLU:HB2	2.23	0.68
1:A:517:ILE:O	1:A:517:ILE:HG22	1.95	0.67
1:A:929:ASN:HB3	1:A:996:PHE:CE1	2.30	0.66
1:A:475:PHE:HZ	1:A:581:GLU:HG2	1.62	0.65
1:A:339:MET:HE3	1:A:424:PHE:HE2	1.62	0.65
1:A:534:ILE:HG13	1:A:535:HIS:ND1	2.12	0.64
1:A:929:ASN:HB3	1:A:996:PHE:CD1	2.33	0.64
1:A:401:SER:HB3	1:A:407:PHE:CD2	2.33	0.64
1:A:1191:ILE:HG22	1:A:1191:ILE:O	1.98	0.64
1:A:357:VAL:HG23	1:A:358:ASP:N	2.13	0.63
1:A:632:MET:HG3	1:A:635:ARG:HH21	1.64	0.63
1:A:443:ILE:HD13	1:A:477:TYR:HE2	1.62	0.63
1:A:475:PHE:CZ	1:A:581:GLU:HG2	2.32	0.63
1:A:594:SER:O	1:A:598:LYS:HG2	1.99	0.63
1:A:741:ASN:OD1	1:A:742:VAL:N	2.31	0.63
1:A:1001:TRP:CD1	1:A:1015:GLN:OE1	2.52	0.62
1:A:357:VAL:HG23	1:A:358:ASP:H	1.64	0.62
1:A:817:ASN:HB2	1:A:818:PRO:CD	2.29	0.62
1:A:441:LEU:HD11	1:A:481:ILE:HG12	1.82	0.62
1:A:791:ASN:HB3	1:A:793:GLU:OE2	2.01	0.61
1:A:1191:ILE:HD11	1:A:1203:SER:HB3	1.82	0.61
1:A:1001:TRP:NE1	1:A:1015:GLN:OE1	2.33	0.61
1:A:517:ILE:O	1:A:517:ILE:CG2	2.49	0.61
1:A:817:ASN:HB2	1:A:818:PRO:HD2	1.83	0.61
1:A:546:VAL:O	1:A:549:ILE:HB	2.00	0.61
1:A:657:LEU:N	1:A:657:LEU:HD22	2.16	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:322:ILE:HG23	1:A:323:PRO:HD2	1.84	0.60
1:A:630:THR:HB	1:A:631:PRO:HD2	1.83	0.60
1:A:1146:TRP:O	1:A:1148:ASN:N	2.35	0.59
1:A:844:ILE:HG23	1:A:845:PRO:HD2	1.84	0.59
1:A:544:LYS:HG3	1:A:546:VAL:HG12	1.85	0.59
1:A:317:ILE:HG12	1:A:327:GLN:OE1	2.03	0.59
1:A:549:ILE:HD13	1:A:571:ILE:HG22	1.85	0.59
1:A:688:ASN:HA	1:A:691:LYS:HG2	1.84	0.59
1:A:476:LYS:HG3	1:A:477:TYR:CE1	2.37	0.58
1:A:1147:HIS:O	1:A:1148:ASN:OD1	2.21	0.58
1:A:637:ASP:HB3	1:A:640:VAL:HG23	1.86	0.58
1:A:441:LEU:O	1:A:442:HIS:C	2.42	0.58
1:A:545:PRO:O	1:A:548:VAL:HG22	2.04	0.57
1:A:653:LEU:HD12	1:A:653:LEU:O	2.04	0.57
1:A:1145:PHE:HE1	1:A:1182:ILE:HG12	1.70	0.57
1:A:1127:GLU:HG2	1:A:1132:PHE:HB2	1.87	0.56
1:A:441:LEU:O	1:A:443:ILE:HG23	2.05	0.56
1:A:443:ILE:HD13	1:A:477:TYR:CE2	2.39	0.56
1:A:965:SER:HB3	1:A:984:ILE:HD12	1.87	0.56
1:A:1146:TRP:O	1:A:1147:HIS:C	2.45	0.56
1:A:469:ILE:O	1:A:472:TYR:HB3	2.06	0.55
1:A:437:PHE:HZ	1:A:481:ILE:HD13	1.72	0.55
1:A:931:VAL:O	1:A:932:SER:HB2	2.06	0.55
1:A:1082:LEU:O	1:A:1086:THR:HG22	2.07	0.55
1:A:873:LEU:HD12	1:A:873:LEU:H	1.72	0.55
1:A:321:ASP:OD1	1:A:986:HIS:HB2	2.07	0.54
1:A:937:LYS:HE2	1:A:944:TYR:CD1	2.41	0.54
1:A:769:TYR:HD2	1:A:777:ILE:HB	1.72	0.54
1:A:1066:ARG:HG3	1:A:1067:ARG:N	2.22	0.54
1:A:977:GLN:O	1:A:980:ILE:HG13	2.07	0.54
1:A:653:LEU:C	1:A:653:LEU:CD1	2.77	0.53
1:A:811:ILE:HB	1:A:846:ILE:HG12	1.90	0.53
1:A:933:VAL:HG23	1:A:951:ILE:HD11	1.90	0.53
1:A:1145:PHE:CE1	1:A:1182:ILE:HG12	2.44	0.53
1:A:475:PHE:HE1	1:A:580:LEU:HD12	1.74	0.53
1:A:475:PHE:CE1	1:A:580:LEU:HD12	2.44	0.53
1:A:614:ILE:HG22	1:A:616:LYS:H	1.74	0.52
1:A:1146:TRP:CD1	1:A:1147:HIS:N	2.78	0.52
1:A:1128:SER:HB2	1:A:1131:THR:OG1	2.08	0.52
1:A:606:LEU:HD13	1:A:611:LYS:HG2	1.90	0.52
1:A:1028:LEU:HD21	1:A:1094:LEU:HD21	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:347:GLU:OE2	1:A:421:ASP:OD1	2.28	0.52
1:A:1173:ARG:O	1:A:1174:ARG:HB2	2.10	0.51
1:A:544:LYS:HB2	1:A:545:PRO:HD2	1.92	0.51
1:A:1173:ARG:HG2	1:A:1174:ARG:H	1.75	0.51
1:A:320:THR:HB	1:A:327:GLN:HE22	1.76	0.51
1:A:347:GLU:HB2	1:A:424:PHE:CE2	2.46	0.51
1:A:873:LEU:HD12	1:A:873:LEU:N	2.25	0.51
1:A:928:VAL:HG12	1:A:951:ILE:HD13	1.93	0.51
1:A:568:LYS:HA	1:A:571:ILE:HG12	1.93	0.51
1:A:930:LEU:O	1:A:1020:ARG:NH1	2.35	0.51
1:A:427:LEU:C	1:A:427:LEU:HD13	2.30	0.50
1:A:1140:VAL:HG12	1:A:1154:THR:HG22	1.93	0.50
1:A:1191:ILE:O	1:A:1191:ILE:CG2	2.57	0.50
1:A:639:ASP:HB2	1:A:907:HIS:CE1	2.46	0.50
1:A:980:ILE:HD12	1:A:981:THR:HG23	1.94	0.50
1:A:803:ILE:HG23	1:A:808:PRO:HD2	1.94	0.50
1:A:803:ILE:HG21	1:A:836:ILE:HD13	1.93	0.50
1:A:777:ILE:N	1:A:777:ILE:HD12	2.27	0.49
1:A:336:TYR:OH	1:A:382:THR:HG22	2.12	0.49
1:A:1146:TRP:C	1:A:1148:ASN:N	2.66	0.49
1:A:873:LEU:H	1:A:873:LEU:CD1	2.26	0.49
1:A:729:PHE:O	1:A:732:LYS:HB2	2.12	0.49
1:A:741:ASN:O	1:A:742:VAL:HB	2.13	0.49
1:A:743:ARG:HB2	1:A:840:ARG:HH22	1.78	0.49
1:A:401:SER:HB3	1:A:407:PHE:CE2	2.48	0.48
1:A:778:ARG:CG	1:A:779:ASP:N	2.76	0.48
1:A:1022:HIS:CG	1:A:1023:PRO:HD2	2.49	0.48
1:A:321:ASP:CG	1:A:986:HIS:HB2	2.34	0.48
1:A:598:LYS:HD3	1:A:599:TYR:HE2	1.79	0.48
1:A:640:VAL:O	1:A:644:MET:HG3	2.14	0.48
1:A:757:GLN:HB3	1:A:763:ASP:OD2	2.13	0.48
1:A:894:LEU:HB2	1:A:899:VAL:CG2	2.44	0.48
1:A:765:ILE:HD13	1:A:823:PHE:CE1	2.49	0.47
1:A:1001:TRP:CD1	1:A:1001:TRP:O	2.67	0.47
1:A:785:ASN:O	1:A:788:ASP:HB2	2.14	0.47
1:A:598:LYS:HD3	1:A:599:TYR:CE2	2.50	0.47
1:A:1148:ASN:HB3	1:A:1164:ALA:HB1	1.95	0.47
1:A:691:LYS:HG3	1:A:692:LEU:N	2.29	0.47
1:A:740:PRO:O	1:A:741:ASN:OD1	2.32	0.47
1:A:386:LEU:HD13	1:A:390:PHE:CE2	2.49	0.47
1:A:1190:VAL:HA	1:A:1202:VAL:HG22	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1118:ASP:O	1:A:1122:GLN:HG3	2.14	0.47
1:A:449:THR:HG22	1:A:453:LYS:HE3	1.97	0.47
1:A:1167:HIS:NE2	1:A:1176:ALA:HB2	2.29	0.47
1:A:437:PHE:CZ	1:A:481:ILE:HD13	2.49	0.47
1:A:540:HIS:HB2	1:A:686:TRP:CE2	2.50	0.47
1:A:619:LEU:N	1:A:619:LEU:HD12	2.30	0.46
1:A:769:TYR:CD2	1:A:777:ILE:HB	2.49	0.46
1:A:1150:ILE:HB	1:A:1162:VAL:HB	1.98	0.46
1:A:466:LEU:HD12	1:A:466:LEU:N	2.31	0.46
1:A:1122:GLN:NE2	1:A:1129:GLU:HB2	2.31	0.46
1:A:1207:HIS:O	1:A:1207:HIS:CG	2.69	0.46
1:A:339:MET:CE	1:A:424:PHE:HE2	2.29	0.46
1:A:1088:LEU:N	1:A:1088:LEU:HD12	2.31	0.46
1:A:394:TYR:C	1:A:395:ARG:HG2	2.35	0.46
1:A:1022:HIS:ND1	1:A:1023:PRO:HD2	2.31	0.46
1:A:740:PRO:O	1:A:741:ASN:CG	2.54	0.45
1:A:1198:ILE:O	1:A:1198:ILE:HG22	2.15	0.45
1:A:657:LEU:N	1:A:657:LEU:CD2	2.80	0.45
1:A:861:GLU:OE1	1:A:861:GLU:HA	2.16	0.45
1:A:767:ALA:HB3	1:A:780:TYR:HB2	1.99	0.45
1:A:320:THR:HB	1:A:327:GLN:NE2	2.32	0.45
1:A:1197:ASN:O	1:A:1198:ILE:C	2.55	0.45
1:A:778:ARG:HG3	1:A:779:ASP:H	1.82	0.45
1:A:659:MET:HG2	1:A:660:SER:N	2.32	0.44
1:A:641:PHE:O	1:A:644:MET:HB2	2.17	0.44
1:A:322:ILE:HG22	1:A:323:PRO:N	2.32	0.44
1:A:545:PRO:O	1:A:549:ILE:HG13	2.18	0.44
1:A:339:MET:HE3	1:A:343:ASP:HB3	2.00	0.44
1:A:929:ASN:O	1:A:996:PHE:HD1	2.01	0.44
1:A:1125:THR:HG21	1:A:1127:GLU:HB2	1.96	0.44
1:A:469:ILE:HG13	1:A:470:TYR:N	2.33	0.44
1:A:1094:LEU:HA	1:A:1097:ILE:HD12	2.00	0.44
1:A:475:PHE:HZ	1:A:581:GLU:CG	2.28	0.43
1:A:694:PHE:CZ	1:A:698:MET:HE3	2.52	0.43
1:A:1163:ASN:C	1:A:1165:GLN:H	2.21	0.43
1:A:1131:THR:O	1:A:1131:THR:HG22	2.17	0.43
1:A:630:THR:CB	1:A:631:PRO:HD2	2.46	0.43
1:A:931:VAL:HG21	1:A:1109:ARG:CZ	2.48	0.43
1:A:831:LEU:HD23	1:A:831:LEU:HA	1.72	0.43
1:A:853:VAL:HG13	1:A:894:LEU:HD21	2.01	0.43
1:A:1191:ILE:HD11	1:A:1203:SER:CB	2.47	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:323:PRO:HG3	1:A:992:ASN:ND2	2.34	0.43
1:A:798:THR:O	1:A:799:LEU:C	2.55	0.43
1:A:936:ASN:O	1:A:939:THR:HG22	2.19	0.43
1:A:1040:ASP:O	1:A:1044:ILE:HG13	2.18	0.43
1:A:1086:THR:HG23	1:A:1088:LEU:H	1.82	0.43
1:A:1019:THR:HB	1:A:1100:GLU:HB3	2.00	0.43
1:A:438:TYR:CD1	1:A:448:VAL:HG11	2.54	0.42
1:A:571:ILE:HG13	1:A:572:ASP:N	2.34	0.42
1:A:759:ARG:HB3	1:A:762:ALA:HB3	2.00	0.42
1:A:941:ASN:ND2	1:A:944:TYR:HB2	2.33	0.42
1:A:412:ASP:OD1	1:A:726:ARG:NH1	2.53	0.42
1:A:1040:ASP:HB3	1:A:1042:ASP:OD1	2.20	0.42
1:A:1188:ALA:HB2	1:A:1204:LEU:HG	2.02	0.42
1:A:475:PHE:CG	1:A:584:LYS:HD2	2.54	0.42
1:A:1020:ARG:HB2	1:A:1100:GLU:CD	2.40	0.42
1:A:1188:ALA:HB1	1:A:1203:SER:O	2.20	0.42
1:A:336:TYR:CD1	1:A:425:HIS:CD2	3.08	0.42
1:A:545:PRO:HG3	1:A:686:TRP:CD2	2.55	0.42
1:A:790:THR:HA	1:A:791:ASN:HA	1.61	0.42
1:A:421:ASP:O	1:A:422:ILE:C	2.56	0.42
1:A:638:PRO:HG3	1:A:720:LEU:CD1	2.50	0.42
1:A:666:ILE:O	1:A:669:LEU:HB2	2.20	0.42
1:A:691:LYS:HG3	1:A:692:LEU:H	1.85	0.42
1:A:448:VAL:O	1:A:451:TYR:HB3	2.20	0.41
1:A:840:ARG:HD2	1:A:842:HIS:CD2	2.55	0.41
1:A:870:LYS:O	1:A:875:LYS:HE3	2.20	0.41
1:A:1118:ASP:HA	1:A:1195:TYR:CD1	2.55	0.41
1:A:772:ARG:CZ	1:A:772:ARG:HB2	2.50	0.41
1:A:322:ILE:CG2	1:A:323:PRO:HD2	2.50	0.41
1:A:736:ALA:O	1:A:1112:PHE:HB2	2.21	0.41
1:A:795:PHE:O	1:A:795:PHE:CG	2.73	0.41
1:A:616:LYS:O	1:A:621:GLU:OE1	2.38	0.41
1:A:1063:ASP:OD2	1:A:1064:PRO:HD2	2.20	0.41
1:A:479:ASN:O	1:A:483:GLU:HG3	2.21	0.41
1:A:663:ALA:O	1:A:667:GLU:HG3	2.21	0.41
1:A:540:HIS:CE1	1:A:543:SER:H	2.38	0.41
1:A:451:TYR:CE1	1:A:469:ILE:HD13	2.55	0.41
1:A:540:HIS:ND1	1:A:541:PRO:HD2	2.35	0.41
1:A:598:LYS:HG3	1:A:599:TYR:CE2	2.55	0.41
1:A:777:ILE:N	1:A:777:ILE:CD1	2.84	0.41
1:A:938:ALA:O	1:A:945:ALA:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:357:VAL:CG2	1:A:358:ASP:N	2.83	0.41
1:A:598:LYS:CD	1:A:599:TYR:CE2	3.04	0.41
1:A:835:GLN:HG2	1:A:835:GLN:O	2.21	0.41
1:A:1087:GLY:C	1:A:1088:LEU:HD12	2.40	0.41
1:A:1202:VAL:HG12	1:A:1203:SER:N	2.36	0.41
1:A:813:ILE:HD11	1:A:824:TYR:HB2	2.03	0.40
1:A:1192:TYR:O	1:A:1200:ALA:HB1	2.21	0.40
1:A:682:ILE:HG23	1:A:683:ALA:N	2.36	0.40
1:A:787:PHE:CD2	1:A:787:PHE:N	2.89	0.40
1:A:1133:PHE:O	1:A:1190:VAL:HG21	2.22	0.40
1:A:1163:ASN:OD1	1:A:1164:ALA:N	2.53	0.40
1:A:1127:GLU:HG2	1:A:1132:PHE:CB	2.50	0.40
1:A:477:TYR:N	1:A:477:TYR:CD1	2.86	0.40
1:A:753:LEU:HB2	1:A:813:ILE:HG22	2.03	0.40
1:A:1032:VAL:HG23	1:A:1033:ALA:N	2.37	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	831/1219 (68%)	760 (92%)	58 (7%)	13 (2%)	<b>9</b> 36

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1117	GLY
1	A	742	VAL
1	A	551	SER
1	A	628	ASN
1	A	762	ALA
1	A	764	ALA

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Mol	Chain	Res	Type
1	A	1147	HIS
1	A	1173	ARG
1	A	674	LEU
1	A	442	HIS
1	A	614	ILE
1	A	357	VAL
1	A	1174	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	762/1108 (69%)	759 (100%)	3 (0%)	<a href="#">91</a>   <a href="#">95</a>

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	689	PHE
1	A	726	ARG
1	A	1204	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	425	HIS
1	A	429	ASN
1	A	909	ASN
1	A	982	HIS
1	A	1074	ASN
1	A	1147	HIS

### 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 monosaccharides 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	843/1219 (69%)	0.27	39 (4%) <span style="border: 1px solid red; padding: 2px;">32</span> <span style="border: 1px solid red; padding: 2px;">30</span>	74, 150, 305, 453	0

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	534	ILE	7.3
1	A	638	PRO	5.3
1	A	519	ILE	5.3
1	A	679	THR	4.7
1	A	569	LEU	4.4
1	A	623	ILE	4.1
1	A	568	LYS	3.9
1	A	642	LEU	3.6
1	A	657	LEU	3.5
1	A	539	ASP	3.4
1	A	535	HIS	3.4
1	A	600	TYR	3.4
1	A	615	GLN	3.3
1	A	624	LYS	3.3
1	A	634	PHE	3.3
1	A	537	PRO	3.2
1	A	516	ASP	3.1
1	A	688	ASN	2.8
1	A	675	GLU	2.7
1	A	690	ARG	2.7
1	A	603	ASP	2.7
1	A	542	SER	2.6
1	A	606	LEU	2.6
1	A	617	GLY	2.5
1	A	1180	TYR	2.5
1	A	613	GLU	2.5
1	A	1179	ILE	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	639	ASP	2.4
1	A	999	ILE	2.4
1	A	527	ASN	2.3
1	A	532	HIS	2.3
1	A	861	GLU	2.3
1	A	543	SER	2.2
1	A	612	LYS	2.2
1	A	485	PHE	2.1
1	A	1145	PHE	2.1
1	A	781	LYS	2.1
1	A	577	TYR	2.0
1	A	655	VAL	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 monosaccharides 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.