



# Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 09:47 AM GMT

PDB ID : 4HWS  
Title : Crystal structure of E. coli Threonyl-tRNA synthetase bound to a novel inhibitor  
Authors : Hilgers, M.T.  
Deposited on : 2012-11-08  
Resolution : 1.70 Å(reported)

This is a full wwPDB 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 <http://wwpdb.org/ValidationPDFNotes.html>

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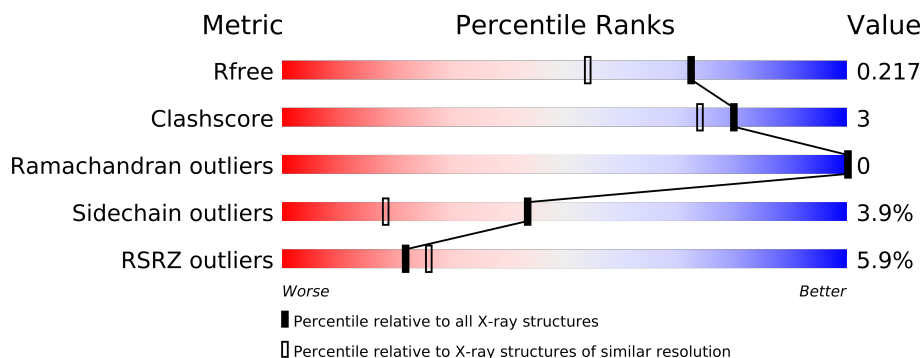
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467  
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 1.70 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	2456 (1.70-1.70)
Clashscore	79885	2929 (1.70-1.70)
Ramachandran outliers	78287	2878 (1.70-1.70)
Sidechain outliers	78261	2878 (1.70-1.70)
RSRZ outliers	66119	2456 (1.70-1.70)

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  $\geq 3$ , 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	411	
1	B	411	

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 7209 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 Threonine-tRNA ligase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	409	Total	C	N	O	S	0	0	0
			3354	2116	596	619	23			
1	B	398	Total	C	N	O	S	0	0	0
			3251	2053	573	602	23			

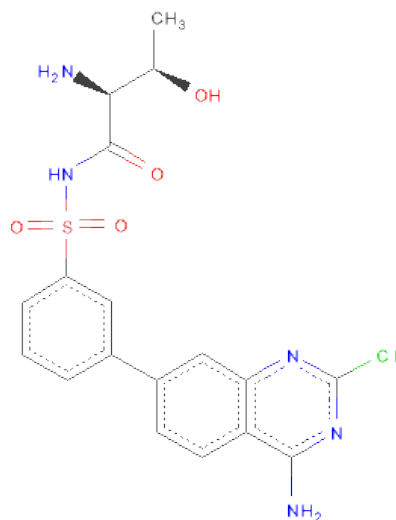
There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	240	MET	-	EXPRESSION TAG	UNP P0A8M3
A	241	ALA	-	EXPRESSION TAG	UNP P0A8M3
A	643	LEU	-	EXPRESSION TAG	UNP P0A8M3
A	644	GLU	-	EXPRESSION TAG	UNP P0A8M3
A	645	HIS	-	EXPRESSION TAG	UNP P0A8M3
A	646	HIS	-	EXPRESSION TAG	UNP P0A8M3
A	647	HIS	-	EXPRESSION TAG	UNP P0A8M3
A	648	HIS	-	EXPRESSION TAG	UNP P0A8M3
A	649	HIS	-	EXPRESSION TAG	UNP P0A8M3
A	650	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	240	MET	-	EXPRESSION TAG	UNP P0A8M3
B	241	ALA	-	EXPRESSION TAG	UNP P0A8M3
B	643	LEU	-	EXPRESSION TAG	UNP P0A8M3
B	644	GLU	-	EXPRESSION TAG	UNP P0A8M3
B	645	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	646	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	647	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	648	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	649	HIS	-	EXPRESSION TAG	UNP P0A8M3
B	650	HIS	-	EXPRESSION TAG	UNP P0A8M3

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Zn	0	0
			1	1		
2	A	1	Total	Zn	0	0
			1	1		

- Molecule 3 is N-{{3-(4-AMINO-2-CHLOROQUINAZOLIN-7-YL)PHENYL}SULFONYL}-L-THREONINAMIDE (three-letter code: 1B3) (formula: C<sub>18</sub>H<sub>18</sub>ClN<sub>5</sub>O<sub>4</sub>S).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	A	1	Total	C	Cl	N	O	S	0	0
			29	18	1	5	4	1		
3	B	1	Total	C	Cl	N	O	S	0	0
			29	18	1	5	4	1		

- Molecule 4 is water.

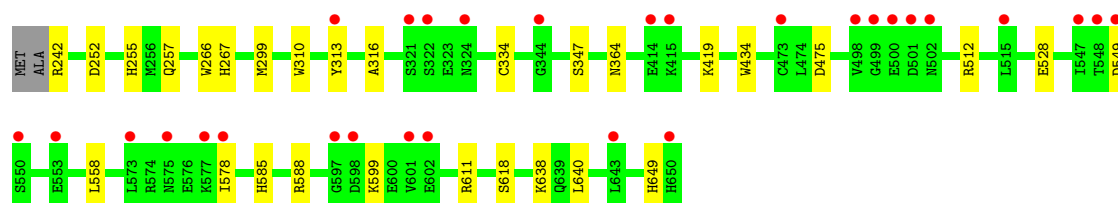
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	274	Total	O	0	0
			274	274		
4	B	270	Total	O	0	0
			270	270		

### 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.

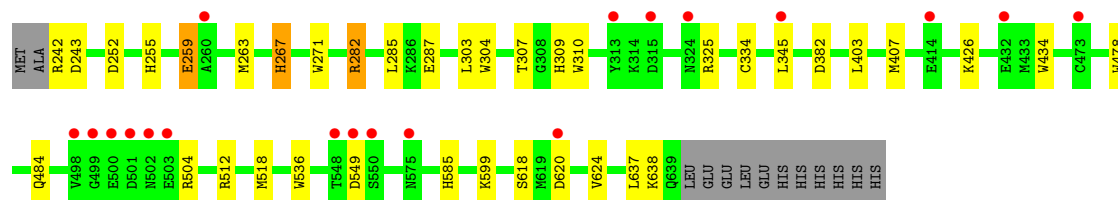
- Molecule 1: Threonine-tRNA ligase

Chain A: 



- Molecule 1: Threonine-tRNA ligase

Chain B: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	86.18Å 110.33Å 114.87Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	33.35 – 1.70 33.35 – 1.70	Depositor EDS
% Data completeness (in resolution range)	90.9 (33.35-1.70) 90.9 (33.35-1.70)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.10 (at 1.70Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, $R_{free}$	0.197 , 0.217 0.197 , 0.217	Depositor DCC
$R_{free}$ test set	5500 reflections (5.26%)	DCC
Wilson B-factor (Å <sup>2</sup> )	26.1	Xtriage
Anisotropy	0.033	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.39 , 41.1	EDS
Estimated twinning fraction	0.008 for -h,l,k	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	0 of 110055 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	7209	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.02% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities 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: ZN, 1B3

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	0.76	3/3431 (0.1%)	0.78	2/4621 (0.0%)
1	B	0.76	6/3322 (0.2%)	0.79	3/4473 (0.1%)
All	All	0.76	9/6753 (0.1%)	0.79	5/9094 (0.1%)

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	304	TRP	CD2-CE2	6.21	1.48	1.41
1	B	271	TRP	CD2-CE2	5.63	1.48	1.41
1	A	266	TRP	CD2-CE2	5.61	1.48	1.41
1	B	478	TRP	CD2-CE2	5.51	1.48	1.41
1	A	310	TRP	CD2-CE2	5.48	1.48	1.41
1	A	434	TRP	CD2-CE2	5.39	1.47	1.41
1	B	310	TRP	CD2-CE2	5.28	1.47	1.41
1	B	536	TRP	CD2-CE2	5.25	1.47	1.41
1	B	434	TRP	CD2-CE2	5.17	1.47	1.41

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	282	ARG	NE-CZ-NH2	-6.36	117.12	120.30
1	B	243	ASP	CB-CG-OD1	5.77	123.49	118.30
1	A	588	ARG	NE-CZ-NH2	-5.65	117.47	120.30
1	A	611	ARG	NE-CZ-NH1	5.56	123.08	120.30
1	B	303	LEU	CA-CB-CG	5.34	127.58	115.30

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	3354	0	0	12	0
1	B	3251	0	0	11	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	29	0	16	0	0
3	B	29	0	16	1	0
4	A	274	0	0	5	1
4	B	270	0	0	6	1
All	All	7209	0	32	23	1

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 3.

All (23) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:263:MET:CE	4:B:807:HOH:O	1.81	1.24
1:A:528:GLU:OE1	1:A:649:HIS:CD2	2.50	0.65
1:A:255:HIS:ND1	1:A:267:HIS:CE1	2.73	0.56
1:B:255:HIS:ND1	1:B:267:HIS:CE1	2.76	0.53
1:A:585:HIS:CD2	4:A:911:HOH:O	2.64	0.50
1:A:475:ASP:OD1	1:A:649:HIS:CE1	2.66	0.48
1:A:252:ASP:OD1	1:A:267:HIS:CD2	2.66	0.48
1:A:242:ARG:N	4:A:1045:HOH:O	2.48	0.47
1:A:638:LYS:CD	4:A:1022:HOH:O	2.62	0.47
1:B:585:HIS:CD2	4:B:813:HOH:O	2.70	0.45
1:B:484:GLN:NE2	3:B:702:1B3:H10	2.15	0.44
1:B:252:ASP:OD1	1:B:267:HIS:CD2	2.71	0.44
1:B:382:ASP:CB	1:B:518:MET:CE	2.96	0.43
1:B:325:ARG:CD	4:B:1025:HOH:O	2.66	0.43
1:B:259:GLU:N	1:B:259:GLU:OE2	2.51	0.43
1:A:242:ARG:NH2	4:A:854:HOH:O	2.52	0.42
1:B:307:THR:OG1	1:B:309:HIS:ND1	2.53	0.42
1:B:403:LEU:CD1	1:B:407:MET:CE	2.97	0.42
1:B:282:ARG:NH1	4:B:998:HOH:O	2.52	0.41

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:299:MET:CB	4:B:1060:HOH:O	2.68	0.41
1:A:316:ALA:O	1:A:364:ASN:N	2.54	0.40
1:A:419:LYS:CE	4:A:946:HOH:O	2.70	0.40
1:A:299:MET:CG	4:B:1060:HOH:O	2.69	0.40

All (1) 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	Distance(Å)	Clash(Å)
4:A:854:HOH:O	4:B:1049:HOH:O[3_644]	1.19	1.01

## 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	407/411 (99%)	400 (98%)	7 (2%)	0	100	100
1	B	396/411 (96%)	388 (98%)	8 (2%)	0	100	100
All	All	803/822 (98%)	788 (98%)	15 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	364/365 (100%)	353 (97%)	11 (3%)	53	29
1	B	353/365 (97%)	336 (95%)	17 (5%)	35	13
All	All	717/730 (98%)	689 (96%)	28 (4%)	43	18

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	257	GLN
1	A	313	TYR
1	A	334	CYS
1	A	347	SER
1	A	512	ARG
1	A	549	ASP
1	A	558	LEU
1	A	578	ILE
1	A	599	LYS
1	A	618	SER
1	A	640	LEU
1	B	242	ARG
1	B	259	GLU
1	B	267	HIS
1	B	285	LEU
1	B	287	GLU
1	B	334	CYS
1	B	345	LEU
1	B	426	LYS
1	B	504	ARG
1	B	512	ARG
1	B	549	ASP
1	B	599	LYS
1	B	618	SER
1	B	620	ASP
1	B	624	VAL
1	B	637	LEU
1	B	638	LYS

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 ⓘ

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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$
3	1B3	A	702	2	31,31,31	2.40	7 (22%)	46,46,46	2.37	14 (30%)
3	1B3	B	702	2	31,31,31	2.51	9 (29%)	46,46,46	2.46	19 (41%)

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
3	1B3	A	702	2	-	0/23/23/23	0/1/3/3
3	1B3	B	702	2	-	0/23/23/23	0/1/3/3

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	702	1B3	C12-S9	-9.85	1.61	1.76
3	A	702	1B3	C12-S9	-8.74	1.63	1.76
3	A	702	1B3	C27-C21	6.33	1.49	1.45
3	B	702	1B3	C27-C21	4.94	1.48	1.45
3	B	702	1B3	C21-C22	3.58	1.48	1.42
3	B	702	1B3	C25-N24	3.47	1.36	1.32
3	B	702	1B3	C4-N5	-3.36	1.31	1.37
3	B	702	1B3	S9-N5	-2.87	1.58	1.64
3	A	702	1B3	C25-N26	2.76	1.35	1.32
3	A	702	1B3	S9-N5	-2.75	1.58	1.64
3	A	702	1B3	C21-C22	2.65	1.46	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	702	1B3	C25-N24	2.61	1.35	1.32
3	B	702	1B3	C3-C4	-2.60	1.50	1.53
3	B	702	1B3	O10-S9	2.57	1.46	1.43
3	A	702	1B3	C3-C4	-2.49	1.50	1.53
3	B	702	1B3	C20-C19	2.10	1.41	1.36

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	702	1B3	O11-S9-O10	-6.70	110.54	119.55
3	B	702	1B3	O11-S9-O10	-6.64	110.62	119.55
3	A	702	1B3	C21-C22-N24	-5.62	117.68	122.86
3	B	702	1B3	C12-S9-N5	5.51	113.16	105.89
3	A	702	1B3	C25-N24-C22	5.48	119.51	114.33
3	A	702	1B3	C27-C21-C22	5.42	119.15	115.72
3	B	702	1B3	C21-C27-N26	-4.79	116.48	121.95
3	B	702	1B3	C25-N24-C22	4.41	118.50	114.33
3	B	702	1B3	C25-N26-C27	4.36	122.57	116.64
3	A	702	1B3	C21-C27-N26	-4.22	117.12	121.95
3	B	702	1B3	C21-C22-N24	-4.10	119.08	122.86
3	B	702	1B3	C27-C21-C22	3.99	118.25	115.72
3	A	702	1B3	C12-S9-N5	3.88	111.01	105.89
3	B	702	1B3	N24-C25-N26	-3.37	125.09	129.78
3	B	702	1B3	C19-C18-C23	3.17	122.28	118.03
3	B	702	1B3	O11-S9-C12	3.06	111.91	107.98
3	A	702	1B3	CL2-C25-N26	3.04	118.70	115.06
3	A	702	1B3	C25-N26-C27	2.82	120.47	116.64
3	B	702	1B3	C14-C13-C12	2.77	122.04	118.95
3	A	702	1B3	C4-N5-S9	-2.71	121.00	124.25
3	A	702	1B3	C19-C18-C23	2.70	121.65	118.03
3	A	702	1B3	N24-C25-N26	-2.70	126.03	129.78
3	B	702	1B3	C19-C20-C21	-2.70	117.14	121.15
3	B	702	1B3	C15-C16-C17	2.61	121.68	118.16
3	B	702	1B3	C20-C21-C22	2.50	120.88	118.32
3	B	702	1B3	CL2-C25-N26	2.42	117.96	115.06
3	B	702	1B3	C4-N5-S9	-2.37	121.41	124.25
3	A	702	1B3	C23-C22-N24	2.36	122.08	118.95
3	B	702	1B3	C19-C18-C16	-2.28	117.40	121.41
3	A	702	1B3	C2-C3-N7	-2.24	106.31	109.22
3	B	702	1B3	O10-S9-C12	-2.22	105.14	107.98
3	A	702	1B3	C14-C13-C12	2.17	121.37	118.95
3	B	702	1B3	C18-C23-C22	-2.04	117.08	120.54

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, 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	409/411 (99%)	0.34	29 (7%) 16 19	17, 26, 51, 71	0
1	B	398/411 (96%)	0.15	19 (4%) 29 33	17, 26, 45, 62	0
All	All	807/822 (98%)	0.25	48 (5%) 22 26	17, 26, 49, 71	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	575	ASN	5.8
1	B	498	VAL	5.2
1	A	548	THR	5.0
1	B	473	CYS	4.9
1	A	597	GLY	4.3
1	A	324	ASN	4.2
1	A	502	ASN	4.2
1	A	549	ASP	3.9
1	B	501	ASP	3.9
1	A	501	ASP	3.8
1	A	550	SER	3.5
1	B	503	GLU	3.4
1	A	500	GLU	3.3
1	A	415	LYS	3.2
1	A	322	SER	3.2
1	B	549	ASP	3.2
1	B	502	ASN	3.1
1	B	500	GLU	3.1
1	A	598	ASP	3.0
1	B	345	LEU	2.9
1	A	643	LEU	2.9
1	B	499	GLY	2.8
1	A	573	LEU	2.8
1	B	324	ASN	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	601	VAL	2.8
1	B	550	SER	2.7
1	A	602	GLU	2.6
1	A	473	CYS	2.6
1	B	432	GLU	2.6
1	A	553	GLU	2.6
1	B	313	TYR	2.5
1	A	578	ILE	2.5
1	B	260	ALA	2.5
1	A	547	ILE	2.4
1	B	414	GLU	2.4
1	B	548	THR	2.3
1	A	515	LEU	2.3
1	A	577	LYS	2.3
1	A	498	VAL	2.3
1	A	313	TYR	2.2
1	A	650	HIS	2.2
1	A	344	GLY	2.2
1	A	499	GLY	2.1
1	A	321	SER	2.1
1	A	414	GLU	2.1
1	B	575	ASN	2.1
1	B	620	ASP	2.1
1	B	315	ASP	2.1

## 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, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
3	1B3	A	702	29/29	0.10	-0.38	18,20,21,25	0
3	1B3	B	702	29/29	0.07	-0.76	18,20,22,23	0
2	ZN	B	701	1/1	0.04	-3.27	18,18,18,18	0
2	ZN	A	701	1/1	0.05	-4.89	19,19,19,19	0

## 6.5 Other polymers

There are no such residues in this entry.