



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 8, 2016 – 05:00 PM EDT

PDB ID : 5KYU  
Title : crystal structure of Sec23 and TANGO1 peptide2 complex  
Authors : Ma, W.; Goldberg, J.  
Deposited on : 2016-07-22  
Resolution : 3.51 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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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 : unknown  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20027939  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20027939

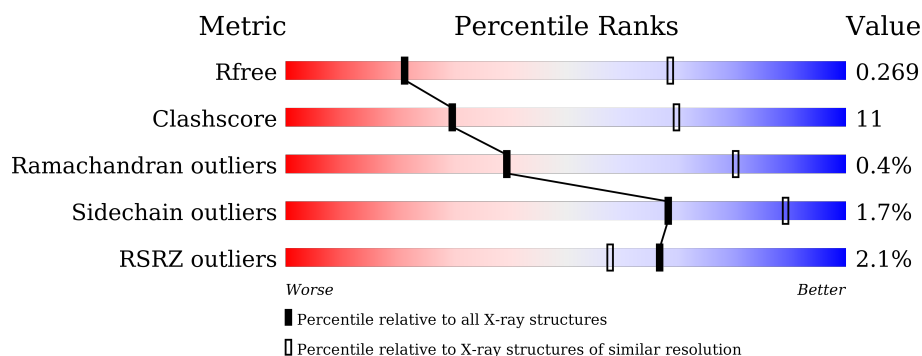
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.51 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))
$R_{free}$	91344	1089 (3.64-3.40)
Clashscore	102246	1197 (3.64-3.40)
Ramachandran outliers	100387	1159 (3.64-3.40)
Sidechain outliers	100360	1160 (3.64-3.40)
RSRZ outliers	91569	1096 (3.64-3.40)

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. 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	765	<div> <div></div> <div>76%</div> <div>16%</div> <div>6%</div> </div>
2	B	767	<div> <div>3%</div> <div>76%</div> <div>22%</div> <div></div> </div>
3	C	8	<div> <div>25%</div> <div>13%</div> <div>63%</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	ZN	B	1101	-	-	X	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 11605 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 Protein transport protein Sec23A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	716	Total	C	N	O	S	0	0	0
			5678	3617	975	1046	40			

- Molecule 2 is a protein called Protein transport protein Sec24D.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	764	Total	C	N	O	S	0	0	0
			5904	3758	993	1101	52			

- Molecule 3 is a protein called TANGO1 peptide2.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	3	Total	C	N	O	0	0	0
			21	15	3	3			

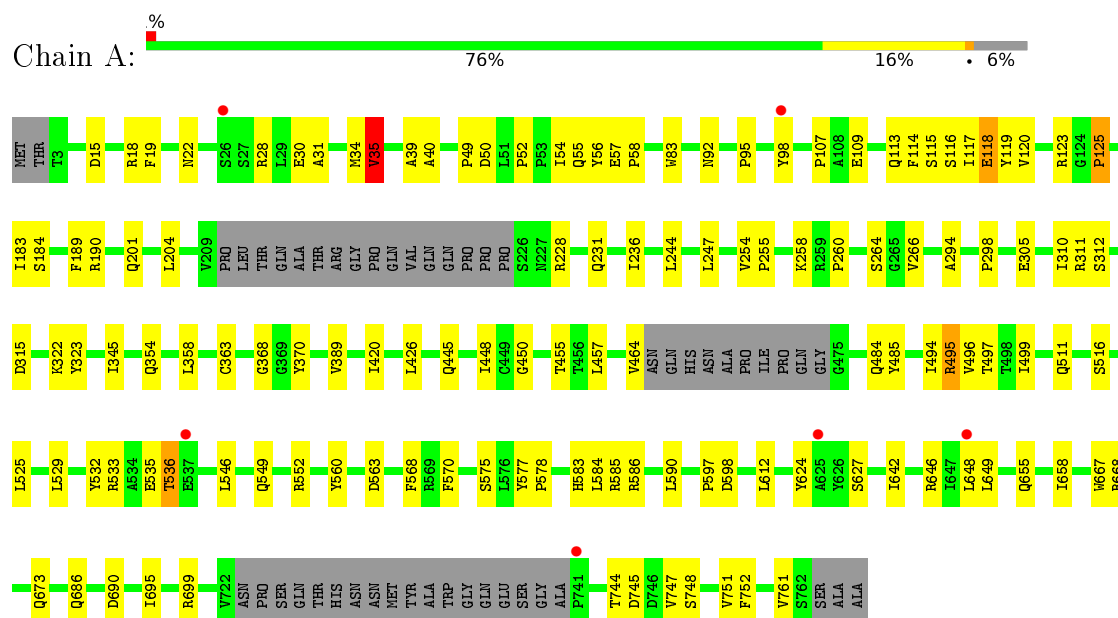
- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

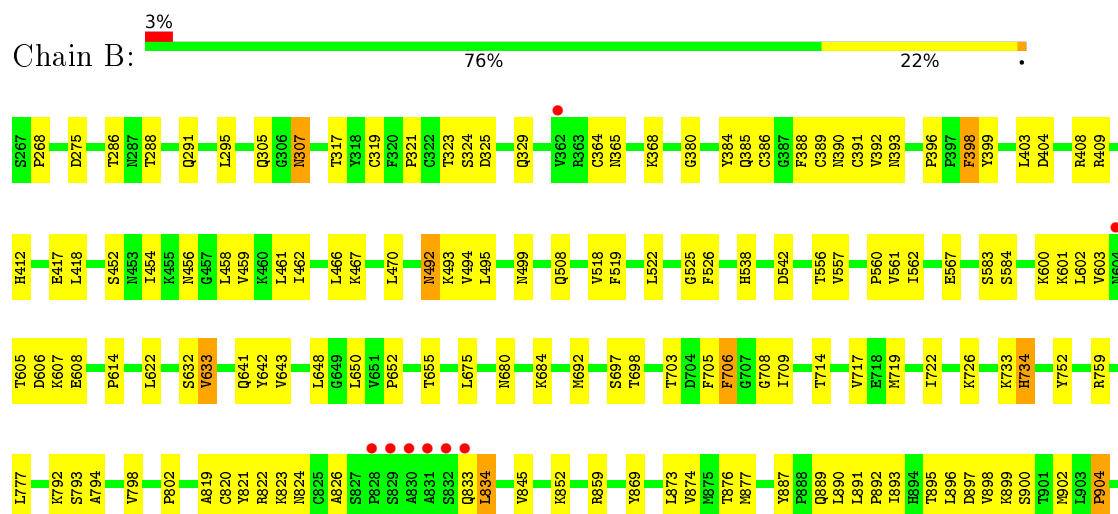
### 3 Residue-property plots

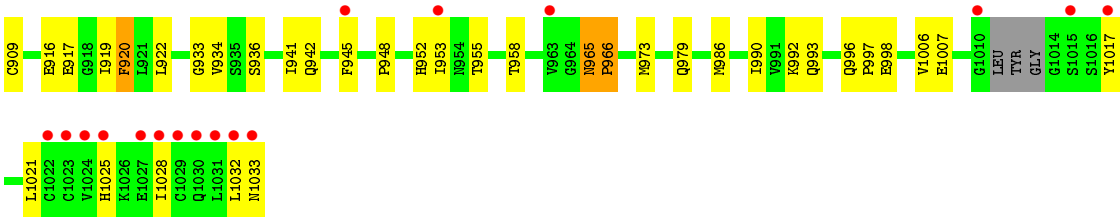
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according 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 ( $\text{RSRZ} > 2$ ). 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: Protein transport protein Sec23A



#### • Molecule 2: Protein transport protein Sec24D





● Molecule 3: TANGO1 peptide2



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	103.43Å 140.93Å 150.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.55 – 3.51 48.55 – 3.51	Depositor EDS
% Data completeness (in resolution range)	97.2 (48.55-3.51) 91.3 (48.55-3.51)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.36 (at 3.48Å)	Xtriage
Refinement program	PHENIX (1.10 _2155: ???)	Depositor
R, $R_{free}$	0.217 , 0.267 0.227 , 0.269	Depositor DCC
$R_{free}$ test set	1879 reflections (7.32%)	DCC
Wilson B-factor (Å <sup>2</sup> )	113.4	Xtriage
Anisotropy	0.626	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 105.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	11605	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	148.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.27% 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](#)

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

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	0.31	0/5811	0.46	0/7870
2	B	0.33	0/6029	0.51	0/8181
3	C	0.27	0/23	0.35	0/32
All	All	0.32	0/11863	0.49	0/16083

There are no bond length outliers.

There are no bond angle outliers.

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	5678	0	5616	97	0
2	B	5904	0	5808	161	0
3	C	21	0	21	1	0
4	A	1	0	0	0	0
4	B	1	0	0	2	0
All	All	11605	0	11445	257	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 11.

All (257) 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)
2:B:385:GLN:HE21	2:B:390:ASN:HB3	1.32	0.93
2:B:389:CYS:HG	4:B:1101:ZN:ZN	0.75	0.92
1:A:15:ASP:OD1	1:A:115:SER:OG	1.90	0.90
2:B:403:LEU:HD12	2:B:404:ASP:H	1.35	0.89
2:B:916:GLU:O	2:B:933:GLY:HA3	1.75	0.87
2:B:874:VAL:HA	2:B:877:MET:HG3	1.58	0.85
1:A:116:SER:HB3	1:A:497:THR:HG23	1.57	0.85
2:B:396:PRO:HB2	2:B:398:PHE:CE1	2.12	0.84
2:B:706:PHE:HE2	2:B:793:SER:HA	1.40	0.83
2:B:364:CYS:HA	2:B:393:ASN:ND2	1.93	0.83
2:B:404:ASP:CB	2:B:408:ARG:O	2.26	0.83
2:B:891:LEU:HD12	2:B:904:PRO:HG2	1.62	0.82
2:B:705:PHE:C	2:B:706:PHE:HD1	1.84	0.79
2:B:396:PRO:HB2	2:B:398:PHE:HE1	1.47	0.79
2:B:403:LEU:CD1	2:B:404:ASP:H	1.98	0.77
2:B:992:LYS:HB2	2:B:996:GLN:HG3	1.66	0.76
1:A:55:GLN:HA	1:A:120:VAL:HB	1.68	0.75
2:B:602:LEU:HD12	2:B:603:VAL:HG23	1.69	0.74
2:B:389:CYS:SG	4:B:1101:ZN:ZN	1.78	0.73
2:B:275:ASP:HB3	2:B:295:LEU:HD12	1.72	0.71
1:A:563:ASP:H	1:A:761:VAL:HB	1.56	0.71
1:A:54:ILE:HG21	1:A:56:TYR:CZ	2.25	0.70
2:B:412:HIS:CE1	2:B:418:LEU:O	2.44	0.70
2:B:897:ASP:O	2:B:900:SER:OG	2.04	0.70
2:B:889:GLN:HG2	2:B:891:LEU:HD21	1.72	0.70
2:B:705:PHE:C	2:B:706:PHE:CD1	2.65	0.69
1:A:499:ILE:O	1:A:499:ILE:HD12	1.93	0.68
2:B:364:CYS:HA	2:B:393:ASN:HD21	1.58	0.68
2:B:823:LYS:HG3	2:B:824:ASN:ND2	2.09	0.67
1:A:49:PRO:CD	1:A:50:ASP:H	2.07	0.67
2:B:396:PRO:CB	2:B:398:PHE:HE1	2.06	0.67
2:B:492:ASN:O	2:B:492:ASN:ND2	2.22	0.67
2:B:822:ARG:HG2	2:B:1028:ILE:HG23	1.76	0.67
2:B:996:GLN:HB3	2:B:997:PRO:HD2	1.77	0.67
1:A:255:PRO:HG2	1:A:258:LYS:HG3	1.77	0.67
2:B:633:VAL:H	2:B:655:THR:HG21	1.60	0.67
1:A:49:PRO:HD2	1:A:50:ASP:H	1.58	0.66
1:A:54:ILE:N	1:A:54:ILE:HD13	2.11	0.66
2:B:823:LYS:HB2	2:B:1033:ASN:HB3	1.77	0.65
2:B:403:LEU:HD12	2:B:404:ASP:N	2.10	0.65
1:A:118:GLU:HG3	1:A:495:ARG:HD3	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:499:ILE:HD12	1:A:499:ILE:C	2.17	0.65
2:B:385:GLN:NE2	2:B:390:ASN:HB3	2.09	0.65
1:A:312:SER:H	1:A:315:ASP:HB2	1.62	0.64
1:A:34:MET:O	1:A:35:VAL:HG12	1.96	0.64
1:A:532:TYR:O	1:A:536:THR:OG1	2.16	0.64
2:B:399:TYR:OH	2:B:417:GLU:OE2	2.14	0.64
1:A:118:GLU:OE2	1:A:485:TYR:OH	2.12	0.64
1:A:533:ARG:HA	1:A:536:THR:OG1	1.97	0.64
2:B:822:ARG:HG2	2:B:1028:ILE:CG2	2.28	0.64
2:B:385:GLN:HG3	2:B:390:ASN:O	1.98	0.64
2:B:365:ASN:H	2:B:393:ASN:HD21	1.45	0.64
2:B:385:GLN:HE21	2:B:390:ASN:CB	2.09	0.64
1:A:15:ASP:OD2	1:A:499:ILE:HG22	1.98	0.63
2:B:286:THR:OG1	2:B:305:GLN:O	2.15	0.63
1:A:117:ILE:HD11	1:A:119:TYR:OH	1.99	0.62
1:A:31:ALA:HA	1:A:34:MET:CG	2.29	0.62
2:B:891:LEU:HD22	2:B:891:LEU:N	2.14	0.62
2:B:820:CYS:HA	2:B:823:LYS:HG2	1.80	0.62
2:B:706:PHE:HD2	2:B:792:LYS:HB3	1.65	0.61
2:B:708:GLY:C	2:B:709:ILE:HG23	2.20	0.61
1:A:667:TRP:CE2	3:C:1802:PRO:HB2	2.34	0.61
2:B:493:LYS:HA	2:B:557:VAL:HG13	1.83	0.61
2:B:386:CYS:O	2:B:390:ASN:HA	2.01	0.60
2:B:819:ALA:HA	2:B:1028:ILE:HG12	1.83	0.60
1:A:368:GLY:HA3	1:A:450:GLY:O	2.01	0.60
2:B:391:CYS:SG	2:B:392:VAL:N	2.75	0.60
1:A:54:ILE:CG2	1:A:56:TYR:CE2	2.85	0.60
1:A:54:ILE:O	1:A:55:GLN:HB2	2.02	0.59
2:B:602:LEU:HD21	2:B:859:ARG:HB2	1.84	0.59
2:B:852:LYS:NZ	2:B:1006:VAL:O	2.34	0.59
1:A:113:GLN:NE2	1:A:114:PHE:CE2	2.63	0.59
1:A:54:ILE:HG22	1:A:56:TYR:CE2	2.38	0.59
1:A:15:ASP:O	1:A:497:THR:HG21	2.02	0.58
1:A:311:ARG:NH2	1:A:598:ASP:OD1	2.36	0.58
1:A:31:ALA:HA	1:A:34:MET:HG2	1.86	0.57
1:A:624:TYR:HB2	1:A:649:LEU:HB3	1.86	0.57
2:B:823:LYS:HG3	2:B:824:ASN:N	2.18	0.57
2:B:706:PHE:CE2	2:B:793:SER:HA	2.31	0.56
2:B:708:GLY:O	2:B:709:ILE:CG2	2.53	0.56
2:B:600:LYS:HA	2:B:859:ARG:NH1	2.19	0.56
2:B:920:PHE:CD1	2:B:920:PHE:N	2.73	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:30:GLU:O	1:A:34:MET:HG2	2.06	0.56
1:A:204:LEU:O	1:A:228:ARG:NH2	2.39	0.56
2:B:706:PHE:HD1	2:B:706:PHE:N	2.03	0.56
2:B:499:ASN:HB3	2:B:508:GLN:HB2	1.87	0.56
2:B:602:LEU:HA	2:B:608:GLU:HB2	1.87	0.56
1:A:668:ARG:HG2	1:A:673:GLN:HE22	1.71	0.55
2:B:329:GLN:NE2	2:B:824:ASN:OD1	2.38	0.55
2:B:317:THR:HG22	2:B:319:CYS:H	1.72	0.55
2:B:821:TYR:O	2:B:826:ALA:HB2	2.05	0.55
1:A:585:ARG:HA	1:A:590:LEU:HD12	1.87	0.55
2:B:386:CYS:O	2:B:390:ASN:N	2.39	0.55
2:B:467:LYS:NZ	2:B:542:ASP:OD1	2.29	0.55
2:B:606:ASP:HA	2:B:802:PRO:HG3	1.89	0.55
2:B:890:LEU:C	2:B:891:LEU:HD22	2.26	0.55
1:A:18:ARG:CZ	1:A:612:LEU:HD22	2.36	0.55
2:B:614:PRO:HG3	2:B:650:LEU:HD22	1.89	0.55
2:B:916:GLU:O	2:B:933:GLY:CA	2.52	0.55
2:B:389:CYS:O	2:B:390:ASN:HB2	2.07	0.54
1:A:310:ILE:HG21	1:A:354:GLN:HB2	1.89	0.54
2:B:889:GLN:HG2	2:B:891:LEU:CD2	2.36	0.54
2:B:522:LEU:HD21	2:B:525:GLY:HA3	1.90	0.54
1:A:113:GLN:HE21	1:A:114:PHE:HE2	1.51	0.54
1:A:258:LYS:HD3	1:A:305:GLU:HA	1.90	0.53
2:B:1025:HIS:HA	2:B:1028:ILE:HB	1.90	0.53
2:B:941:ILE:HG23	2:B:953:ILE:HD11	1.89	0.53
2:B:275:ASP:CB	2:B:295:LEU:HD12	2.37	0.53
2:B:403:LEU:HG	2:B:404:ASP:N	2.23	0.53
2:B:823:LYS:HE3	2:B:824:ASN:HD21	1.73	0.53
2:B:934:VAL:HG13	2:B:993:GLN:HB3	1.89	0.53
2:B:834:LEU:HD13	2:B:1021:LEU:HB3	1.90	0.53
2:B:891:LEU:N	2:B:891:LEU:CD2	2.73	0.52
2:B:945:PHE:HE2	2:B:990:ILE:HD13	1.74	0.52
2:B:396:PRO:HB2	2:B:398:PHE:CD1	2.45	0.52
2:B:706:PHE:N	2:B:706:PHE:CD1	2.72	0.52
2:B:409:ARG:O	2:B:412:HIS:HB2	2.09	0.52
2:B:288:THR:HB	2:B:291:GLN:HB2	1.89	0.52
2:B:462:ILE:O	2:B:466:LEU:HB2	2.10	0.52
2:B:641:GLN:HG2	2:B:642:TYR:H	1.75	0.52
1:A:686:GLN:NE2	1:A:690:ASP:OD1	2.33	0.52
1:A:49:PRO:CD	1:A:50:ASP:N	2.73	0.52
2:B:388:PHE:HA	2:B:697:SER:HA	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:403:LEU:CG	2:B:404:ASP:N	2.73	0.51
2:B:726:LYS:HD2	2:B:876:THR:OG1	2.10	0.51
1:A:123:ARG:HG3	1:A:125:PRO:CD	2.40	0.51
2:B:384:TYR:CZ	2:B:393:ASN:HB2	2.45	0.51
2:B:396:PRO:CB	2:B:398:PHE:CE1	2.86	0.51
1:A:57:GLU:HG3	1:A:58:PRO:HD2	1.92	0.51
2:B:605:THR:C	2:B:607:LYS:H	2.13	0.51
1:A:54:ILE:CG2	1:A:56:TYR:CZ	2.92	0.51
1:A:31:ALA:HA	1:A:34:MET:HG3	1.91	0.51
2:B:708:GLY:O	2:B:709:ILE:HG23	2.11	0.50
2:B:895:THR:HG23	2:B:896:LEU:N	2.25	0.50
2:B:919:ILE:C	2:B:920:PHE:CD1	2.84	0.50
2:B:380:GLY:HA2	2:B:403:LEU:HD22	1.93	0.50
1:A:426:LEU:HD12	1:A:445:GLN:HB3	1.94	0.50
2:B:823:LYS:HE3	2:B:824:ASN:ND2	2.27	0.50
1:A:484:GLN:HG2	1:A:494:ILE:HG12	1.93	0.49
1:A:642:ILE:HA	1:A:648:LEU:HD11	1.94	0.49
2:B:275:ASP:CB	2:B:295:LEU:CD1	2.89	0.49
1:A:35:VAL:HG21	1:A:552:ARG:CB	2.43	0.49
2:B:909:CYS:O	2:B:1007:GLU:HB2	2.12	0.49
2:B:823:LYS:HG3	2:B:824:ASN:HD22	1.78	0.49
1:A:118:GLU:HG3	1:A:495:ARG:CD	2.42	0.48
2:B:1032:LEU:O	2:B:1033:ASN:HB2	2.13	0.48
1:A:649:LEU:HD23	1:A:658:ILE:HG12	1.95	0.48
2:B:268:PRO:HG2	2:B:887:TYR:CE1	2.48	0.48
2:B:708:GLY:C	2:B:709:ILE:CG2	2.81	0.48
2:B:705:PHE:O	2:B:706:PHE:CD1	2.66	0.48
2:B:874:VAL:CA	2:B:877:MET:HG3	2.38	0.48
1:A:39:ALA:HB3	1:A:525:LEU:HD13	1.95	0.48
2:B:601:LYS:H	2:B:859:ARG:HH12	1.61	0.48
1:A:35:VAL:HG21	1:A:552:ARG:HB3	1.95	0.48
2:B:386:CYS:O	2:B:390:ASN:CA	2.62	0.48
1:A:116:SER:HA	1:A:496:VAL:O	2.15	0.47
2:B:518:VAL:HG21	2:B:560:PRO:HB3	1.97	0.47
1:A:560:TYR:HB3	1:A:568:PHE:HA	1.97	0.47
1:A:114:PHE:HB3	1:A:117:ILE:CG2	2.44	0.47
2:B:461:LEU:HD11	2:B:675:LEU:HD11	1.96	0.47
1:A:231:GLN:HB2	1:A:236:ILE:HG13	1.96	0.47
2:B:583:SER:OG	2:B:584:SER:N	2.47	0.47
2:B:365:ASN:N	2:B:393:ASN:HD21	2.12	0.46
2:B:452:SER:O	2:B:456:ASN:ND2	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:562:ILE:HB	2:B:622:LEU:HD21	1.98	0.46
2:B:899:LYS:HD2	2:B:899:LYS:HA	1.67	0.45
2:B:307:ASN:N	2:B:307:ASN:OD1	2.49	0.45
2:B:492:ASN:C	2:B:494:VAL:H	2.19	0.45
2:B:268:PRO:HG2	2:B:887:TYR:CZ	2.52	0.45
1:A:370:TYR:HE2	1:A:389:VAL:HG13	1.82	0.45
1:A:420:ILE:HD11	1:A:529:LEU:HD23	1.97	0.45
2:B:324:SER:N	2:B:734:HIS:HD2	2.14	0.45
2:B:680:ASN:O	2:B:684:LYS:HG3	2.17	0.45
1:A:499:ILE:CD1	1:A:499:ILE:C	2.85	0.45
1:A:95:PRO:HG2	1:A:98:TYR:CD1	2.52	0.45
2:B:492:ASN:HA	2:B:556:THR:HG22	1.99	0.44
1:A:183:ILE:HG12	1:A:184:SER:N	2.31	0.44
1:A:744:THR:HG21	1:A:752:PHE:HD1	1.83	0.44
1:A:116:SER:HA	1:A:497:THR:HA	1.98	0.44
1:A:448:ILE:HD11	1:A:457:LEU:HD11	2.00	0.44
1:A:511:GLN:H	1:A:511:GLN:CD	2.21	0.44
2:B:869:TYR:CZ	2:B:873:LEU:HD11	2.52	0.44
1:A:123:ARG:HG3	1:A:125:PRO:HD2	2.00	0.44
1:A:228:ARG:HA	1:A:231:GLN:HE21	1.83	0.44
2:B:467:LYS:HB3	2:B:538:HIS:CE1	2.53	0.44
1:A:254:VAL:HG21	1:A:260:PRO:HG3	2.00	0.44
1:A:358:LEU:HD22	1:A:597:PRO:HB3	2.00	0.43
1:A:695:ILE:HD11	1:A:699:ARG:NH2	2.33	0.43
2:B:466:LEU:O	2:B:470:LEU:HG	2.17	0.43
1:A:190:ARG:NH1	2:B:519:PHE:HB3	2.32	0.43
2:B:692:MET:HB3	2:B:717:VAL:HB	1.99	0.43
1:A:266:VAL:HG22	1:A:298:PRO:HD2	2.00	0.43
1:A:546:LEU:HD21	1:A:584:LEU:HD23	1.99	0.43
2:B:404:ASP:CB	2:B:408:ARG:CB	2.96	0.43
1:A:55:GLN:HG2	1:A:120:VAL:HG21	2.01	0.43
1:A:123:ARG:HG3	1:A:125:PRO:HD3	2.00	0.43
2:B:823:LYS:CG	2:B:824:ASN:N	2.80	0.43
2:B:454:ILE:HD13	2:B:459:VAL:HG21	2.00	0.43
2:B:632:SER:HA	2:B:655:THR:OG1	2.19	0.43
1:A:22:ASN:HB2	1:A:516:SER:HB2	2.00	0.43
1:A:747:VAL:CG1	1:A:751:VAL:HB	2.48	0.43
2:B:948:PRO:HG2	2:B:952:HIS:ND1	2.34	0.43
1:A:189:PHE:HZ	1:A:204:LEU:HD21	1.84	0.43
1:A:35:VAL:HG22	1:A:549:GLN:NE2	2.33	0.43
1:A:19:PHE:CD2	1:A:40:ALA:HB2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:83:TRP:CE2	1:A:92:ASN:HB2	2.53	0.43
2:B:979:GLN:HE22	2:B:986:MET:H	1.67	0.43
1:A:322:LYS:HE3	1:A:323:TYR:CZ	2.54	0.43
2:B:602:LEU:HD21	2:B:859:ARG:CB	2.48	0.42
1:A:570:PHE:CD1	1:A:575:SER:HB3	2.53	0.42
2:B:955:THR:O	2:B:958:THR:OG1	2.36	0.42
2:B:892:PRO:HG2	2:B:895:THR:HG21	2.02	0.42
1:A:35:VAL:HG22	1:A:549:GLN:HE21	1.83	0.42
2:B:822:ARG:CG	2:B:1028:ILE:HG23	2.47	0.42
1:A:668:ARG:HA	1:A:673:GLN:NE2	2.34	0.42
2:B:897:ASP:O	2:B:900:SER:CB	2.68	0.42
2:B:845:VAL:HG22	2:B:1017:TYR:CE1	2.55	0.42
2:B:893:ILE:N	2:B:893:ILE:HD13	2.34	0.42
1:A:15:ASP:HB3	1:A:497:THR:CG2	2.50	0.42
2:B:633:VAL:HG13	2:B:652:PRO:HA	2.02	0.42
2:B:898:VAL:HG12	2:B:899:LYS:N	2.35	0.42
1:A:28:ARG:HD2	1:A:464:VAL:HA	2.02	0.41
2:B:495:LEU:HD21	2:B:561:VAL:HG22	2.02	0.41
1:A:345:ILE:HG21	1:A:363:CYS:HB3	2.02	0.41
1:A:18:ARG:NE	1:A:612:LEU:HD22	2.35	0.41
2:B:643:VAL:HG13	2:B:648:LEU:HD12	2.01	0.41
2:B:833:GLN:O	2:B:1025:HIS:NE2	2.53	0.41
1:A:627:SER:HB3	1:A:646:ARG:HG3	2.01	0.41
2:B:965:ASN:HB3	2:B:966:PRO:HD3	2.02	0.41
1:A:54:ILE:HG22	1:A:56:TYR:CD2	2.56	0.41
1:A:577:TYR:HB3	1:A:578:PRO:HD3	2.02	0.41
2:B:388:PHE:O	2:B:698:THR:N	2.50	0.41
2:B:794:ALA:O	2:B:798:VAL:HG23	2.21	0.41
2:B:902:MET:CB	2:B:973:MET:HE1	2.51	0.41
2:B:904:PRO:CD	2:B:904:PRO:O	2.68	0.41
2:B:917:GLU:O	2:B:936:SER:HA	2.21	0.41
1:A:264:SER:HB2	1:A:294:ALA:HB2	2.02	0.41
2:B:321:PRO:HD3	2:B:777:LEU:HD21	2.02	0.41
2:B:601:LYS:HB3	2:B:605:THR:HG21	2.01	0.41
2:B:719:MET:SD	2:B:722:ILE:HD12	2.61	0.41
2:B:890:LEU:HD13	2:B:922:LEU:HD12	2.03	0.41
2:B:996:GLN:C	2:B:998:GLU:H	2.24	0.41
2:B:398:PHE:N	2:B:398:PHE:CD1	2.89	0.41
2:B:403:LEU:CD1	2:B:404:ASP:N	2.73	0.41
2:B:752:TYR:O	2:B:759:ARG:HD2	2.21	0.41
1:A:107:PRO:HB2	1:A:109:GLU:OE2	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:747:VAL:HG12	1:A:748:SER:O	2.21	0.40
2:B:368:LYS:HA	2:B:368:LYS:HD3	1.96	0.40
2:B:458:LEU:O	2:B:462:ILE:HG13	2.21	0.40
2:B:942:GLN:HG2	2:B:948:PRO:HA	2.03	0.40
1:A:244:LEU:HD23	1:A:247:LEU:HD12	2.04	0.40
2:B:822:ARG:HG2	2:B:1028:ILE:HG21	2.03	0.40
1:A:583:HIS:HA	1:A:586:ARG:HG2	2.04	0.40
2:B:409:ARG:O	2:B:412:HIS:CB	2.69	0.40
2:B:499:ASN:HA	2:B:525:GLY:O	2.21	0.40
2:B:703:THR:HG21	2:B:733:LYS:HB2	2.03	0.40
2:B:889:GLN:CG	2:B:891:LEU:HD21	2.48	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	708/765 (92%)	675 (95%)	30 (4%)	3 (0%)	39	80
2	B	760/767 (99%)	698 (92%)	59 (8%)	3 (0%)	39	80
3	C	1/8 (12%)	1 (100%)	0	0	100	100
All	All	1469/1540 (95%)	1374 (94%)	89 (6%)	6 (0%)	39	80

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	35	VAL
1	A	52	PRO
2	B	966	PRO
1	A	125	PRO
2	B	965	ASN
2	B	904	PRO

### 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	624/666 (94%)	615 (99%)	9 (1%)	74	91
2	B	651/681 (96%)	638 (98%)	13 (2%)	63	87
3	C	3/7 (43%)	3 (100%)	0	100	100
All	All	1278/1354 (94%)	1256 (98%)	22 (2%)	68	89

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	VAL
1	A	118	GLU
1	A	201	GLN
1	A	455	THR
1	A	495	ARG
1	A	535	GLU
1	A	536	THR
1	A	655	GLN
1	A	745	ASP
2	B	307	ASN
2	B	323	THR
2	B	325	ASP
2	B	398	PHE
2	B	492	ASN
2	B	526	PHE
2	B	567	GLU
2	B	633	VAL
2	B	706	PHE
2	B	714	THR
2	B	734	HIS
2	B	834	LEU
2	B	920	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:



Mol	Chain	Res	Type
1	A	673	GLN
2	B	329	GLN
2	B	365	ASN
2	B	385	GLN
2	B	390	ASN
2	B	393	ASN
2	B	412	HIS
2	B	734	HIS
2	B	824	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules 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 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

### 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	716/765 (93%)	-0.04	6 (0%) 87 80	60, 139, 207, 258	0
2	B	764/767 (99%)	0.07	25 (3%) 50 41	86, 139, 234, 393	0
3	C	3/8 (37%)	1.38	0 100 100	291, 291, 302, 304	0
All	All	1483/1540 (96%)	0.02	31 (2%) 67 58	60, 139, 217, 393	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	830	ALA	11.0
2	B	832	SER	8.9
2	B	831	ALA	7.5
2	B	1029	CYS	7.0
2	B	1031	LEU	5.4
2	B	1010	GLY	5.4
2	B	1032	LEU	4.6
2	B	1023	CYS	4.6
2	B	833	GLN	4.5
2	B	829	SER	4.3
2	B	1030	GLN	4.2
2	B	1033	ASN	4.1
1	A	741	PRO	3.8
2	B	1027	GLU	3.5
2	B	1028	ILE	3.1
1	A	648	LEU	2.9
2	B	963	VAL	2.8
2	B	604	ASN	2.7
2	B	828	PRO	2.7
2	B	1025	HIS	2.6
2	B	1024	VAL	2.6
2	B	1022	CYS	2.4
1	A	537	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
2	B	953	ILE	2.3
2	B	1015	SER	2.2
1	A	26	SER	2.1
1	A	625	ALA	2.1
2	B	362	VAL	2.1
2	B	1017	TYR	2.1
1	A	98	TYR	2.0
2	B	945	PHE	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 carbohydrates in this entry.

## 6.4 Ligands [i](#)

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	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
4	ZN	B	1101	1/1	0.89	0.20	-0.09	155,155,155,155	0
4	ZN	A	801	1/1	0.96	0.11	-1.37	111,111,111,111	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.