



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 16, 2023 – 11:07 AM EST

PDB ID : 4OY2  
Title : Crystal structure of TAF1-TAF7, a TFIID subcomplex  
Authors : Bhattacharya, S.; Lou, X.; Rajashankar, K.; Jacobson, R.H.; Webb, P.  
Deposited on : 2014-02-10  
Resolution : 2.90 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  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

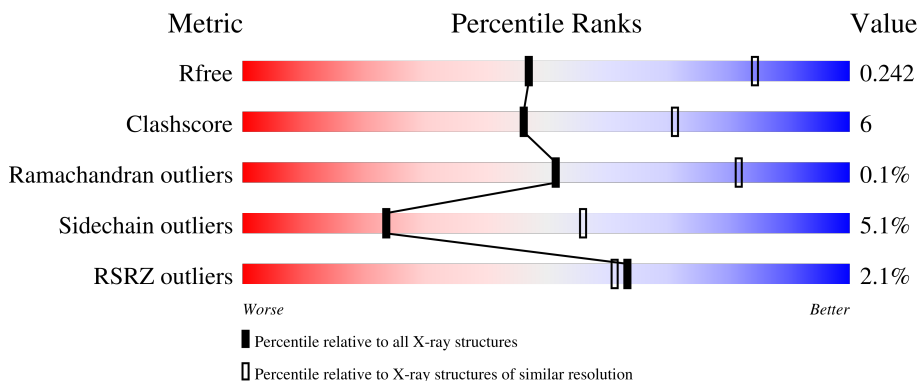
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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	506	 6% 76% 16% • 7%
1	C	506	 6% 78% 12% • 9%
1	E	506	 % 72% 18% • 8%
2	B	235	 77% 19% ••
2	D	235	 3% 77% 18% •

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Mol	Chain	Length	Quality of chain
2	F	235	 73% 22% ..

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 16474 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 Transcription initiation factor TFIID subunit 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	470	Total 3726	C 2358	N 660	O 696	S 1	Se 11	0	3	0
1	C	460	Total 3526	C 2231	N 619	O 664	S 1	Se 11	0	2	0
1	E	468	Total 3787	C 2401	N 670	O 704	S 1	Se 11	0	8	0

- Molecule 2 is a protein called Transcription initiation factor TFIID subunit 7.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
2	B	229	Total 1825	C 1157	N 301	O 361	S 1	Se 5	0	0	0
2	D	225	Total 1774	C 1123	N 295	O 350	S 1	Se 5	0	1	0
2	F	225	Total 1814	C 1149	N 298	O 361	S 1	Se 5	0	3	0

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	Zn 1	0	0

- Molecule 4 is 2-AMINO-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: TRS) (formula: C<sub>4</sub>H<sub>12</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
4	D	1	8	4	1	3	0	0

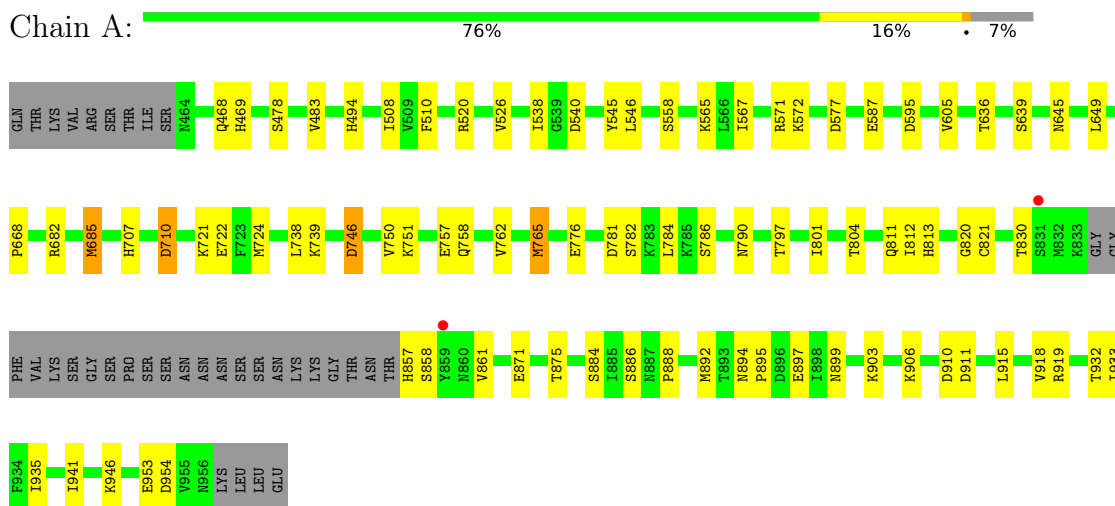
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	3	Total	O	0	0
			3	3		
5	C	2	Total	O	0	0
			2	2		
5	E	5	Total	O	0	0
			5	5		
5	D	2	Total	O	0	0
			2	2		
5	F	1	Total	O	0	0
			1	1		

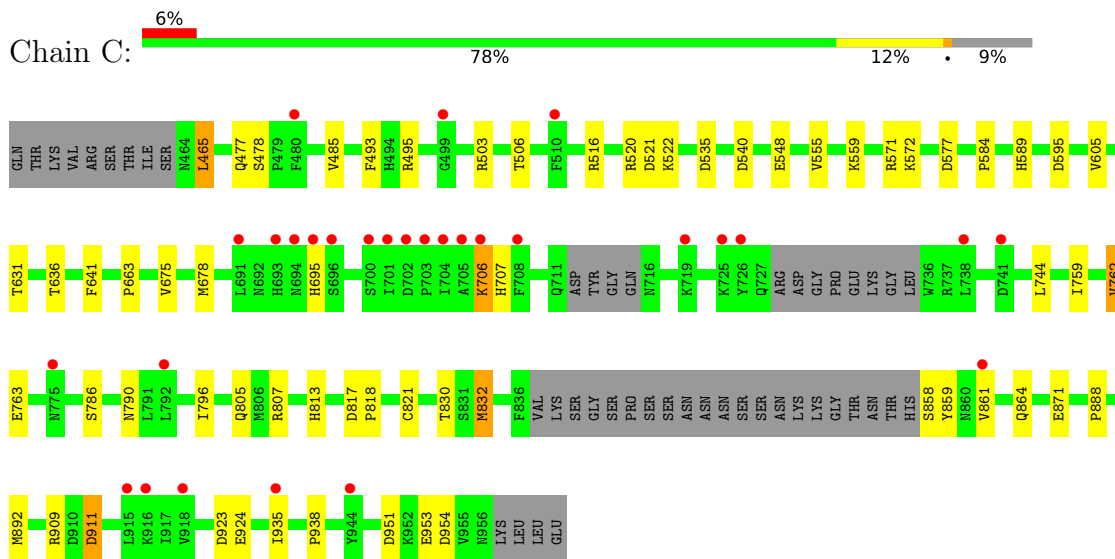
### 3 Residue-property plots [i](#)

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: Transcription initiation factor TFIID subunit 1

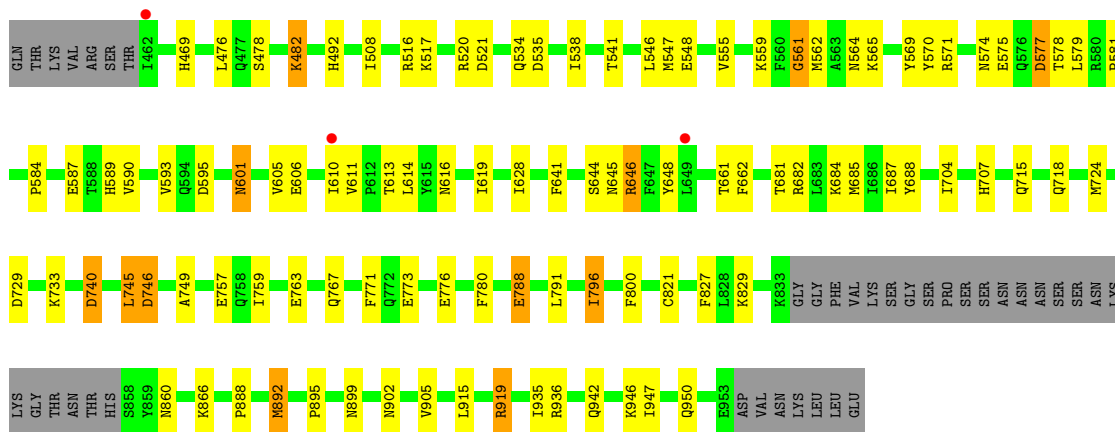


- Molecule 1: Transcription initiation factor TFIID subunit 1

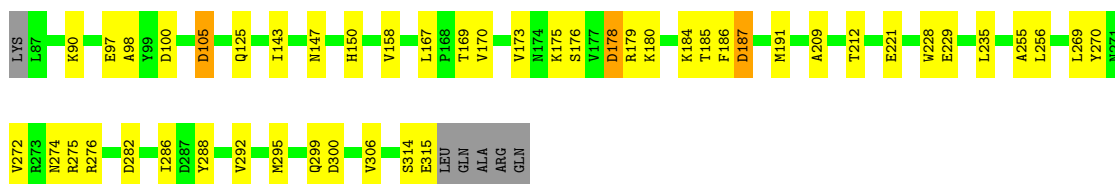


- Molecule 1: Transcription initiation factor TFIID subunit 1

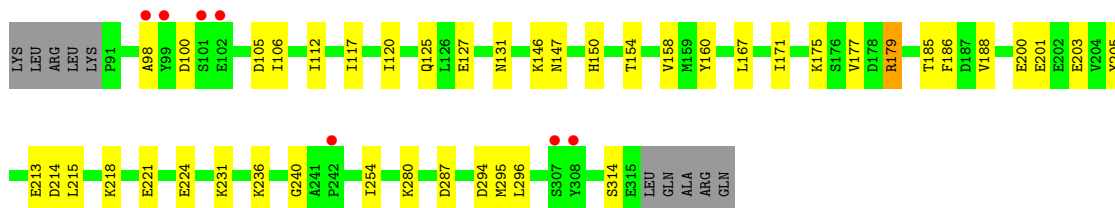
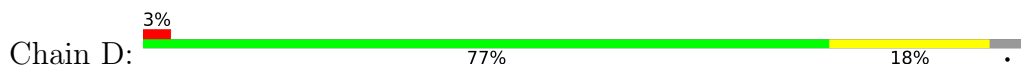




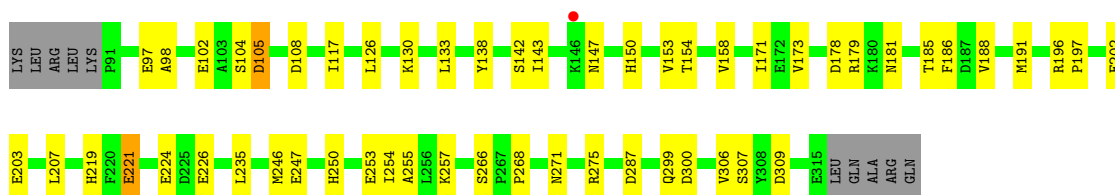
• Molecule 2: Transcription initiation factor TFIID subunit 7



• Molecule 2: Transcription initiation factor TFIID subunit 7



• Molecule 2: Transcription initiation factor TFIID subunit 7



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	122.22Å 123.66Å 229.61Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	83.68 – 2.90 84.14 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.8 (83.68-2.90) 99.9 (84.14-2.90)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.05 (at 2.91Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
R, $R_{free}$	0.209 , 0.243 0.207 , 0.242	Depositor DCC
$R_{free}$ test set	3936 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	70.6	Xtrriage
Anisotropy	0.078	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 49.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.014 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	16474	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	80.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.59% 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: TRS, 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	0.26	0/3809	0.44	0/5140
1	C	0.25	0/3598	0.44	0/4861
1	E	0.27	0/3884	0.44	0/5227
2	B	0.25	0/1853	0.44	0/2502
2	D	0.25	0/1804	0.46	0/2439
2	F	0.26	0/1850	0.43	0/2496
All	All	0.26	0/16798	0.44	0/22665

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	3726	0	3572	50	0
1	C	3526	0	3290	36	0
1	E	3787	0	3713	64	0
2	B	1825	0	1781	34	0
2	D	1774	0	1704	25	0
2	F	1814	0	1776	35	0
3	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	8	0	12	1	0
5	A	3	0	0	0	0
5	C	2	0	0	0	0
5	D	2	0	0	0	0
5	E	5	0	0	0	0
5	F	1	0	0	0	0
All	All	16474	0	15848	204	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 6.

All (204) 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:C:832:MSE:HG2	1:C:861:VAL:HG12	1.56	0.88
1:E:682:ARG:NH1	2:F:98:ALA:O	2.22	0.73
1:A:682:ARG:NH1	2:B:98:ALA:O	2.21	0.72
1:E:571:ARG:NH2	1:E:595:ASP:O	2.23	0.72
2:F:202:GLU:HG3	2:F:246:MSE:HE1	1.74	0.70
2:B:147:ASN:HB3	2:B:150:HIS:HB2	1.75	0.68
1:E:559:LYS:H	1:E:562:MSE:HE3	1.57	0.67
1:A:571:ARG:NH2	1:A:595:ASP:O	2.27	0.67
1:E:682:ARG:HA	1:E:685:MSE:HE2	1.76	0.66
2:D:127:GLU:O	2:D:131:ASN:ND2	2.29	0.65
1:C:786:SER:O	1:C:790:ASN:ND2	2.29	0.65
1:E:646[B]:ARG:NH1	1:E:648:TYR:OH	2.30	0.64
1:E:469:HIS:NE2	1:E:757:GLU:OE2	2.23	0.64
1:A:682:ARG:NH2	1:A:707:HIS:O	2.31	0.64
1:C:923:ASP:OD1	1:C:924:GLU:N	2.33	0.62
1:E:919:ARG:NH1	2:F:300:ASP:OD2	2.32	0.62
1:C:805:GLN:OE1	1:C:807:ARG:NH1	2.33	0.61
1:E:581:PRO:HB2	1:E:610:ILE:HD11	1.81	0.61
1:A:919:ARG:HG3	2:B:306:VAL:HG12	1.83	0.61
1:E:740:ASP:OD1	1:E:740:ASP:N	2.31	0.60
1:A:776:GLU:OE2	1:A:946:LYS:NZ	2.34	0.60
1:C:503:ARG:O	1:C:506:THR:OG1	2.11	0.60
1:A:786:SER:O	1:A:790:ASN:ND2	2.33	0.59
2:F:266:SER:HB3	2:F:268:PRO:HD2	1.83	0.59
1:A:899:ASN:ND2	2:B:275:ARG:O	2.32	0.59
1:C:584:PRO:O	2:D:179:ARG:NH1	2.35	0.58
1:A:892:MSE:HE3	1:A:895:PRO:HB3	1.83	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:235:LEU:HD22	2:F:255:ALA:HB2	1.85	0.58
1:A:919:ARG:NH2	2:B:299:GLN:OE1	2.36	0.58
1:C:813:HIS:ND1	1:C:871:GLU:OE2	2.37	0.58
2:D:214:ASP:OD2	2:D:231:LYS:NZ	2.37	0.58
1:C:540:ASP:OD2	2:D:175:LYS:NZ	2.32	0.58
2:D:185:THR:OG1	2:D:186:PHE:N	2.36	0.57
1:A:906:LYS:NZ	1:A:910:ASP:OD1	2.32	0.57
1:A:572:LYS:HB3	1:A:577:ASP:HB3	1.87	0.56
2:D:179:ARG:HH21	4:D:401:TRS:H11	1.69	0.56
1:A:468:GLN:HG2	1:A:526:VAL:HB	1.88	0.56
2:F:105:ASP:OD2	2:F:105:ASP:N	2.34	0.56
1:E:687:ILE:HD13	1:E:724:MSE:HE2	1.86	0.56
1:E:538:ILE:HD11	2:F:185:THR:HG21	1.88	0.55
1:E:574[B]:ASN:OD1	1:E:575:GLU:N	2.39	0.55
2:D:205:TYR:HD1	2:D:254:ILE:HG21	1.71	0.55
1:A:558:SER:O	2:B:184:LYS:NZ	2.40	0.55
1:A:813:HIS:ND1	1:A:871:GLU:OE2	2.40	0.55
1:A:540:ASP:OD2	2:B:175:LYS:NZ	2.40	0.55
1:E:919:ARG:NH2	2:F:299:GLN:OE1	2.39	0.55
2:D:147:ASN:HB3	2:D:150:HIS:HB2	1.89	0.55
1:A:915:LEU:HB3	1:A:935:ILE:HB	1.89	0.55
1:C:571:ARG:NH2	1:C:595:ASP:O	2.40	0.54
1:A:587:GLU:HB2	2:B:180:LYS:HD3	1.90	0.54
1:A:565:LYS:HB3	1:A:567:ILE:HD11	1.88	0.54
1:C:909:ARG:HG3	1:C:938:PRO:HB3	1.89	0.54
2:B:169:THR:HG21	2:B:269:LEU:HD13	1.89	0.54
2:F:117:ILE:HG12	2:F:188:VAL:HG11	1.88	0.54
2:D:294:ASP:OD1	2:D:295:MSE:N	2.41	0.54
1:C:535:ASP:O	2:D:175:LYS:NZ	2.34	0.54
2:B:178:ASP:HB3	2:B:180:LYS:H	1.74	0.53
2:F:221:GLU:HA	2:F:224:GLU:HB3	1.90	0.53
1:A:668:PRO:O	1:A:765:MSE:HG3	2.08	0.53
1:A:892:MSE:HE1	2:B:270:TYR:HB3	1.91	0.53
1:E:936:ARG:HH21	2:F:226:GLU:HB2	1.73	0.53
2:F:133:LEU:HD23	2:F:138:TYR:HE2	1.74	0.53
2:F:207:LEU:O	2:F:257:LYS:NZ	2.32	0.53
1:A:746:ASP:OD1	1:A:746:ASP:N	2.40	0.52
1:A:899:ASN:HB2	2:B:274:ASN:O	2.10	0.52
1:C:832:MSE:HA	1:C:864:GLN:HE22	1.75	0.52
1:A:888:PRO:HB3	1:A:892:MSE:HE2	1.92	0.52
2:D:200:GLU:HB2	2:D:203:GLU:HG3	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:919:ARG:NH1	2:B:300:ASP:OD1	2.43	0.52
1:E:746:ASP:OD2	1:E:746:ASP:N	2.39	0.51
1:E:796:ILE:HG13	1:E:827:PHE:HB2	1.90	0.51
2:F:147:ASN:HB3	2:F:150:HIS:HB2	1.92	0.51
2:F:178:ASP:OD1	2:F:178:ASP:N	2.42	0.51
1:E:570:TYR:HD2	1:E:590:VAL:HG13	1.75	0.51
2:F:196:ARG:NH2	2:F:203:GLU:OE1	2.43	0.51
1:A:888:PRO:HB3	1:A:892:MSE:CE	2.41	0.51
1:E:492:HIS:HE1	2:F:287:ASP:OD2	1.93	0.51
1:E:682:ARG:NH2	1:E:707:HIS:O	2.45	0.50
1:A:571:ARG:HD2	1:A:605:VAL:O	2.12	0.50
1:C:888:PRO:HB3	1:C:892:MSE:HE3	1.94	0.50
2:B:167:LEU:HD21	2:B:191:MSE:HE3	1.93	0.50
2:F:143:ILE:HG12	2:F:153:VAL:HG22	1.93	0.50
1:C:516:ARG:NH2	1:C:521:ASP:OD2	2.36	0.49
1:C:675:VAL:HA	1:C:678:MSE:HG3	1.94	0.49
1:E:892:MSE:HE2	1:E:895:PRO:HB3	1.94	0.49
1:E:534:GLN:HB2	1:E:641:PHE:CE2	2.48	0.49
1:E:899:ASN:OD1	1:E:902:ASN:ND2	2.45	0.49
1:C:858:SER:OG	1:C:859:TYR:N	2.44	0.49
1:E:555:VAL:HB	1:E:619:ILE:HG21	1.95	0.49
1:A:899:ASN:O	1:A:903:LYS:HB2	2.13	0.49
1:A:724:MSE:HA	1:A:738:LEU:HA	1.95	0.49
2:B:272:VAL:HG23	2:B:276:ARG:HB3	1.95	0.48
1:A:494:HIS:ND1	2:B:187:ASP:OD2	2.38	0.48
1:E:919:ARG:HG3	2:F:306:VAL:HG12	1.96	0.48
2:D:215:LEU:HD23	2:D:218:LYS:HD3	1.94	0.48
1:A:751:LYS:NZ	2:B:105:ASP:OD1	2.34	0.48
1:E:559:LYS:N	1:E:562:MSE:HE3	2.27	0.48
1:A:897:GLU:HG2	2:B:275:ARG:HG2	1.96	0.48
1:E:776:GLU:HG3	1:E:946:LYS:HE2	1.96	0.48
1:E:548:GLU:HG3	2:F:171:ILE:HG12	1.96	0.48
1:E:565:LYS:NZ	2:F:181:ASN:OD1	2.30	0.48
1:C:935:ILE:HG13	2:D:296:LEU:HD21	1.95	0.47
1:E:476:LEU:HD22	1:E:759:ILE:HD12	1.97	0.47
1:C:520:ARG:O	1:C:520:ARG:NH1	2.43	0.47
1:C:572:LYS:HB3	1:C:577:ASP:HB3	1.96	0.47
1:E:561:GLY:HA2	1:E:562:MSE:O	2.14	0.47
2:F:142:SER:HB3	2:F:154:THR:HB	1.96	0.47
1:E:559:LYS:HG3	1:E:562:MSE:HE3	1.96	0.47
1:A:894:ASN:HB3	1:A:897:GLU:HB3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:510:PHE:CE1	1:A:649:LEU:HB2	2.50	0.47
1:E:571:ARG:HD2	1:E:605:VAL:O	2.15	0.47
2:F:250:HIS:ND1	2:F:253:GLU:OE1	2.34	0.47
1:E:559:LYS:NZ	1:E:763:GLU:OE1	2.45	0.46
1:A:469:HIS:NE2	1:A:757:GLU:OE2	2.42	0.46
1:C:559:LYS:NZ	1:C:763:GLU:OE2	2.38	0.46
2:B:209:ALA:O	2:B:212:THR:OG1	2.31	0.46
2:B:105:ASP:OD2	2:B:105:ASP:N	2.49	0.46
2:D:100:ASP:O	2:D:106:ILE:HD11	2.15	0.46
1:E:729:ASP:HA	1:E:733:LYS:HD2	1.97	0.46
2:B:187:ASP:N	2:B:187:ASP:OD1	2.49	0.46
2:D:146:LYS:HD2	2:D:201:GLU:HB3	1.98	0.46
1:A:508:ILE:HB	2:B:143:ILE:HB	1.98	0.45
1:A:639:SER:HB3	1:A:645:ASN:HB3	1.98	0.45
1:C:548:GLU:HG3	2:D:171:ILE:HG12	1.98	0.45
1:E:681:THR:O	1:E:685:MSE:HG3	2.15	0.45
2:B:125:GLN:NE2	2:B:158:VAL:HG21	2.31	0.45
2:D:125:GLN:HG3	2:D:160:TYR:OH	2.16	0.45
1:E:905:VAL:HG21	2:F:219:HIS:CD2	2.52	0.45
1:E:915:LEU:HB3	1:E:935:ILE:HB	1.98	0.45
1:E:547:MSE:HE2	1:E:614:LEU:HD13	1.98	0.45
1:E:601:ASN:OD1	1:E:601:ASN:N	2.49	0.45
1:E:644[B]:SER:OG	1:E:645:ASN:N	2.49	0.45
1:E:684:LYS:HE2	1:E:688:TYR:HE2	1.82	0.45
2:F:147:ASN:ND2	2:F:247:GLU:OE2	2.50	0.45
1:E:771:PHE:HE2	1:E:788:GLU:HG2	1.81	0.45
2:B:314:SER:HA	2:B:315:GLU:HA	1.55	0.45
2:D:221:GLU:HA	2:D:224:GLU:HB3	1.97	0.45
1:E:684:LYS:HE2	1:E:688:TYR:CE2	2.52	0.45
2:B:98:ALA:HB1	2:B:100:ASP:OD2	2.17	0.45
2:F:117:ILE:HG21	2:F:191:MSE:HE2	1.99	0.45
1:C:571:ARG:HD2	1:C:605:VAL:O	2.17	0.45
1:E:546:LEU:HD22	2:F:173:VAL:HG22	1.99	0.45
1:C:465:LEU:HD13	1:C:589[B]:HIS:CE1	2.52	0.44
1:E:516:ARG:NH2	1:E:521:ASP:OD2	2.34	0.44
1:E:791:LEU:HA	1:E:796:ILE:HD13	1.99	0.44
2:F:185:THR:OG1	2:F:186:PHE:N	2.49	0.44
1:C:759:ILE:O	1:C:762:VAL:HG12	2.17	0.44
1:C:951:ASP:HA	1:C:954:ASP:HB2	2.00	0.44
2:B:185:THR:OG1	2:B:186:PHE:N	2.50	0.44
2:B:235:LEU:HD22	2:B:255:ALA:HB2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:228:TRP:CD1	2:B:256:LEU:HD22	2.53	0.44
2:D:236:LYS:HB3	2:D:240:GLY:HA2	2.00	0.44
2:F:126:LEU:O	2:F:130:LYS:HG3	2.18	0.43
1:E:520:ARG:NH2	1:E:535:ASP:OD1	2.50	0.43
1:A:721:LYS:O	1:A:739:LYS:NZ	2.31	0.43
2:D:117:ILE:HG12	2:D:188:VAL:HG11	2.00	0.43
1:A:710:ASP:OD2	1:A:710:ASP:N	2.44	0.43
1:E:745:LEU:HB2	1:E:749:ALA:HB3	2.00	0.43
2:D:213:GLU:CD	2:D:218:LYS:HD2	2.39	0.43
1:A:781:ASP:HB3	1:A:784:LEU:HB3	2.00	0.43
1:E:508:ILE:HB	2:F:143:ILE:HB	2.01	0.43
2:F:196:ARG:NH1	2:F:197:PRO:O	2.52	0.43
1:C:796:ILE:HD13	1:C:796:ILE:HA	1.90	0.42
1:A:884:SER:O	1:E:829:LYS:NZ	2.53	0.42
1:E:482:LYS:HE2	2:F:97:GLU:HB3	2.01	0.42
1:E:771:PHE:CE2	1:E:788:GLU:HG2	2.54	0.42
1:A:538:ILE:HD11	2:B:185:THR:HG21	2.02	0.42
1:A:820:GLY:HA3	1:A:899:ASN:HD21	1.84	0.42
1:E:569:TYR:O	1:E:610:ILE:HA	2.19	0.42
1:E:662:PHE:HD1	1:E:800:PHE:CE1	2.38	0.42
1:E:947:ILE:O	1:E:950:GLN:HG2	2.19	0.42
2:B:282:ASP:O	2:B:286:ILE:HG13	2.19	0.42
1:A:797:THR:O	1:A:801:ILE:HG12	2.19	0.42
1:C:631:THR:HB	2:D:120:ILE:O	2.20	0.42
2:D:98:ALA:HB1	2:D:100:ASP:OD2	2.20	0.42
1:C:555:VAL:HG11	1:C:663:PRO:HB3	2.02	0.42
1:E:780:PHE:HB3	1:E:942:GLN:HG3	2.01	0.42
2:B:288:TYR:O	2:B:292:VAL:HG23	2.20	0.42
1:A:811:GLN:HG2	1:A:830:THR:HB	2.02	0.41
1:C:495[B]:ARG:NH1	2:D:167:LEU:O	2.52	0.41
1:C:493:PHE:O	1:C:495[B]:ARG:HG2	2.20	0.41
2:D:125:GLN:NE2	2:D:158:VAL:HG21	2.35	0.41
1:A:894:ASN:HA	1:A:895:PRO:HD2	1.88	0.41
1:E:577:ASP:OD1	1:E:579:LEU:HG	2.20	0.41
1:E:584:PRO:O	2:F:179:ARG:NH1	2.53	0.41
1:E:611:VAL:O	1:E:613:THR:HG23	2.20	0.41
1:A:915:LEU:HB2	1:A:941:ILE:HG12	2.01	0.41
1:C:641:PHE:HD1	1:C:641:PHE:HA	1.75	0.41
1:E:707:HIS:NE2	2:F:102:GLU:HG2	2.35	0.41
1:C:817:ASP:HA	1:C:818:PRO:HD3	1.90	0.41
1:A:545:TYR:CE2	2:B:176:SER:HB3	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:706:LYS:HE3	1:C:707:HIS:CE1	2.56	0.41
1:A:858:SER:O	1:A:861:VAL:HG22	2.20	0.41
2:F:271:ASN:O	2:F:275[B]:ARG:HB2	2.21	0.41
1:A:758:GLN:O	1:A:762:VAL:HG23	2.21	0.41
1:C:909:ARG:NH2	1:C:911:ASP:OD1	2.51	0.41
1:E:517:LYS:O	1:E:520:ARG:HB3	2.21	0.41
1:A:546:LEU:HD22	2:B:173:VAL:HG22	2.02	0.41
1:E:619:ILE:HG21	1:E:661:THR:HB	2.02	0.41
1:E:564:ASN:OD1	1:E:616:ASN:ND2	2.53	0.40
1:E:888:PRO:O	1:E:892:MSE:HB2	2.20	0.40
1:C:864:GLN:HE21	1:C:864:GLN:HB3	1.75	0.40
1:C:495[B]:ARG:HE	1:C:495[B]:ARG:HB3	1.69	0.40
2:B:178:ASP:O	2:B:179:ARG:HB2	2.22	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	469/506 (93%)	449 (96%)	18 (4%)	2 (0%)	34	66
1	C	454/506 (90%)	433 (95%)	21 (5%)	0	100	100
1	E	472/506 (93%)	451 (96%)	20 (4%)	1 (0%)	47	78
2	B	227/235 (97%)	220 (97%)	7 (3%)	0	100	100
2	D	224/235 (95%)	216 (96%)	8 (4%)	0	100	100
2	F	226/235 (96%)	212 (94%)	14 (6%)	0	100	100
All	All	2072/2223 (93%)	1981 (96%)	88 (4%)	3 (0%)	51	82

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	685	MSE
1	E	561	GLY
1	A	812	ILE

### 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	396/449 (88%)	374 (94%)	22 (6%)	21	52
1	C	360/449 (80%)	345 (96%)	15 (4%)	30	63
1	E	414/449 (92%)	385 (93%)	29 (7%)	15	41
2	B	200/209 (96%)	191 (96%)	9 (4%)	27	61
2	D	190/209 (91%)	182 (96%)	8 (4%)	30	63
2	F	201/209 (96%)	193 (96%)	8 (4%)	31	65
All	All	1761/1974 (89%)	1670 (95%)	91 (5%)	24	55

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	478	SER
1	A	483	VAL
1	A	520	ARG
1	A	636	THR
1	A	685	MSE
1	A	710	ASP
1	A	722	GLU
1	A	746	ASP
1	A	750	VAL
1	A	765	MSE
1	A	782	SER
1	A	804	THR
1	A	821	CYS
1	A	857	HIS
1	A	875	THR
1	A	886	SER

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	911	ASP
1	A	918	VAL
1	A	932	THR
1	A	933	ILE
1	A	953	GLU
1	A	954	ASP
1	C	465	LEU
1	C	477	GLN
1	C	478	SER
1	C	485	VAL
1	C	522	LYS
1	C	636	THR
1	C	695	HIS
1	C	706	LYS
1	C	744	LEU
1	C	762	VAL
1	C	821	CYS
1	C	830	THR
1	C	832	MSE
1	C	911	ASP
1	C	953	GLU
1	E	478	SER
1	E	482	LYS
1	E	541	THR
1	E	577	ASP
1	E	578	THR
1	E	587	GLU
1	E	589[A]	HIS
1	E	589[B]	HIS
1	E	593	VAL
1	E	601	ASN
1	E	606	GLU
1	E	628	ILE
1	E	646[A]	ARG
1	E	646[B]	ARG
1	E	704	ILE
1	E	715	GLN
1	E	718	GLN
1	E	740	ASP
1	E	745	LEU
1	E	746	ASP
1	E	767	GLN

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Mol	Chain	Res	Type
1	E	773	GLU
1	E	788	GLU
1	E	796	ILE
1	E	821	CYS
1	E	860	ASN
1	E	866	LYS
1	E	892	MSE
1	E	919	ARG
2	B	90	LYS
2	B	97	GLU
2	B	105	ASP
2	B	170	VAL
2	B	178	ASP
2	B	187	ASP
2	B	221	GLU
2	B	229	GLU
2	B	295	MSE
2	D	105	ASP
2	D	112	ILE
2	D	154	THR
2	D	177	VAL
2	D	179	ARG
2	D	280	LYS
2	D	287	ASP
2	D	314	SER
2	F	104	SER
2	F	105	ASP
2	F	108	ASP
2	F	158	VAL
2	F	221	GLU
2	F	254	ILE
2	F	307	SER
2	F	309	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	492	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](#)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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
4	TRS	D	401	-	7,7,7	0.30	0	9,9,9	0.22	0

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
4	TRS	D	401	-	-	2/9/9/9	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	D	401	TRS	N-C-C3-O3
4	D	401	TRS	C2-C-C3-O3

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	401	TRS	1	0

## 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	459/506 (90%)	0.04	2 (0%) 92 93	54, 76, 120, 153	0
1	C	449/506 (88%)	0.38	29 (6%) 18 14	43, 84, 163, 191	0
1	E	457/506 (90%)	0.19	3 (0%) 87 87	44, 70, 102, 133	0
2	B	224/235 (95%)	0.07	0 100 100	52, 73, 103, 149	0
2	D	220/235 (93%)	0.30	7 (3%) 47 43	50, 86, 131, 141	0
2	F	220/235 (93%)	0.13	1 (0%) 91 91	49, 76, 110, 131	0
All	All	2029/2223 (91%)	0.19	42 (2%) 63 61	43, 77, 128, 191	0

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	694	ASN	4.7
2	D	307	SER	4.6
1	C	691	LEU	4.2
1	C	703	PRO	3.9
1	C	693	HIS	3.9
1	C	704	ILE	3.8
1	C	695	HIS	3.7
1	C	775	ASN	3.5
1	C	696	SER	3.4
2	D	99	TYR	3.2
1	E	462	ILE	3.2
1	C	701	ILE	3.1
2	D	102	GLU	3.1
2	D	308	TYR	2.9
1	C	725	LYS	2.8
1	C	510	PHE	2.8
1	C	708	PHE	2.8
1	C	719	LYS	2.6
2	D	101	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	E	649	LEU	2.5
1	C	702	ASP	2.5
1	C	944	TYR	2.5
1	C	916	LYS	2.4
1	A	859	TYR	2.4
1	C	706	LYS	2.4
1	C	861	VAL	2.4
1	C	935	ILE	2.4
1	C	738	LEU	2.4
1	C	792	LEU	2.3
1	E	610	ILE	2.3
1	C	700	SER	2.3
1	C	499	GLY	2.3
1	C	480	PHE	2.3
1	C	915	LEU	2.2
1	C	705	ALA	2.2
1	C	741	ASP	2.2
1	C	726	TYR	2.2
1	C	918	VAL	2.2
2	F	146	LYS	2.1
2	D	242	PRO	2.1
2	D	98	ALA	2.1
1	A	831	SER	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](#)

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. 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.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
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3	ZN	A	1001	1/1	0.77	0.08	134,134,134,134	0
4	TRS	D	401	8/8	0.85	0.16	97,103,107,108	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.