



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 08:02 PM GMT

PDB ID : 1IES  
Title : TETRAGONAL CRYSTAL STRUCTURE OF NATIVE HORSE SPLEEN FERRITIN  
Authors : Granier, T.; Gallois, B.; Dautant, A.; Langlois D'Estaintot, B.; Precigoux, G.  
Deposited on : 1996-05-28  
Resolution : 2.60 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 : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

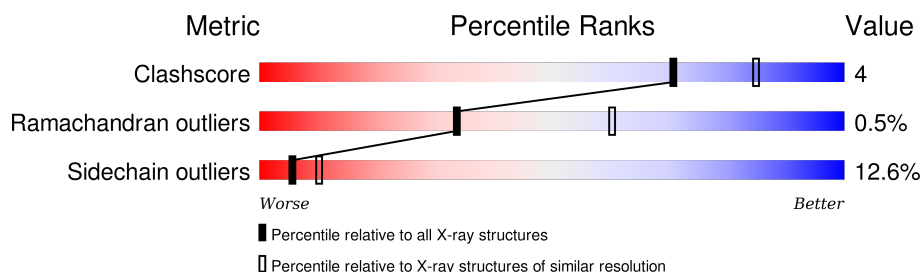
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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))
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	174	
1	B	174	
1	C	174	
1	D	174	
1	E	174	
1	F	174	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 8665 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 FERRITIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			
1	B	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			
1	C	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			
1	D	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			
1	E	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			
1	F	174	Total	C	N	O	S	0	0	0
			1398	879	246	268	5			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	93	LEU	PRO	CONFLICT	UNP P02791
B	93	LEU	PRO	CONFLICT	UNP P02791
C	93	LEU	PRO	CONFLICT	UNP P02791
D	93	LEU	PRO	CONFLICT	UNP P02791
E	93	LEU	PRO	CONFLICT	UNP P02791
F	93	LEU	PRO	CONFLICT	UNP P02791

- Molecule 2 is CADMIUM ION (three-letter code: CD) (formula: Cd).

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

- Molecule 3 is water.

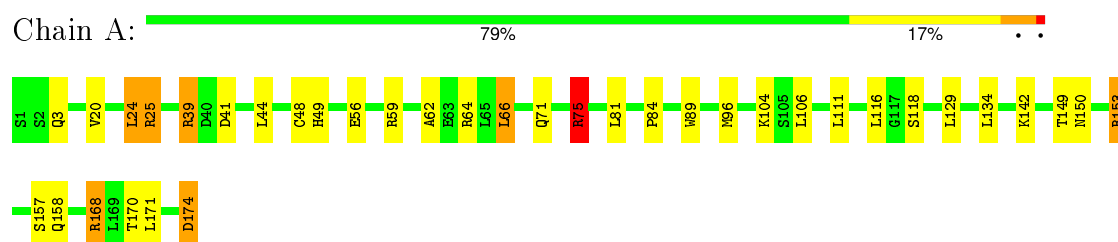
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	51	Total 51	O 51	0	0
3	B	52	Total 52	O 52	0	0
3	C	49	Total 49	O 49	0	0
3	D	38	Total 38	O 38	0	0
3	E	39	Total 39	O 39	0	0
3	F	43	Total 43	O 43	0	0

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

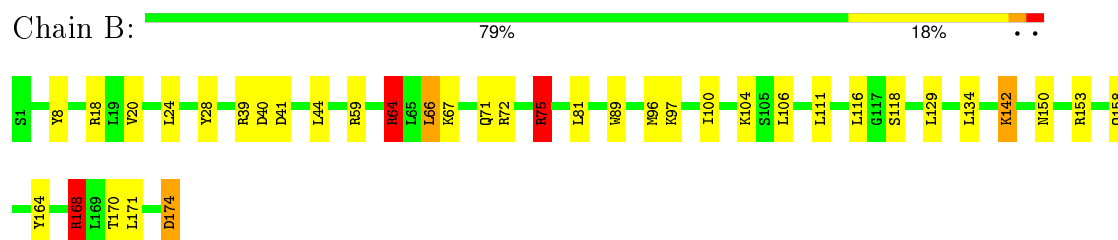
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according 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.

Note EDS was not executed.

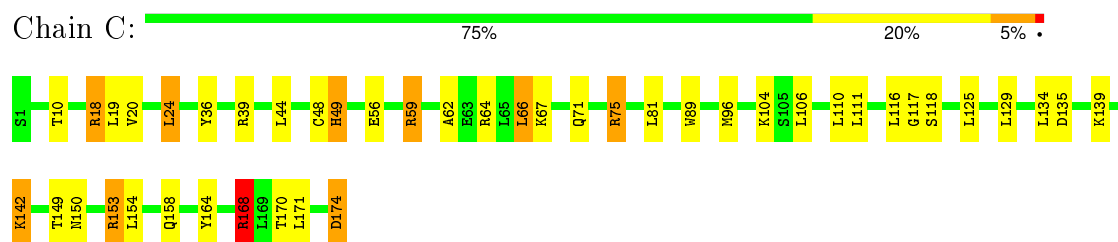
#### • Molecule 1: FERRITIN



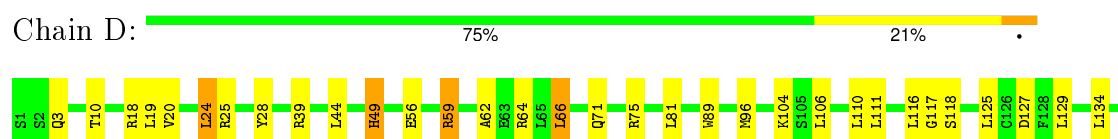
#### • Molecule 1: FERRITIN

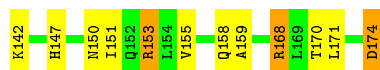


#### • Molecule 1: FERRITIN

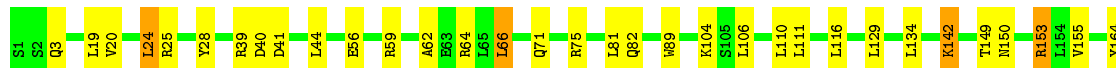
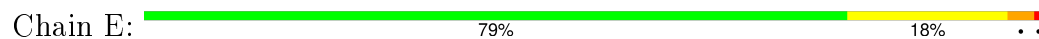


#### • Molecule 1: FERRITIN

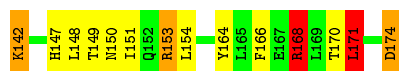
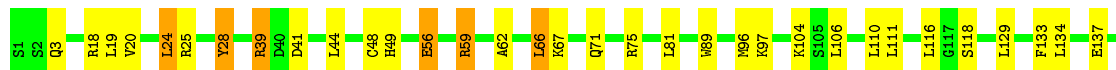




• Molecule 1: FERRITIN



• Molecule 1: FERRITIN



## 4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section will therefore be incomplete.

Property	Value	Source
Space group	P 4 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	147.23Å 147.23Å 152.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.60	Depositor
% Data completeness (in resolution range)	(Not available) (8.00-2.60)	Depositor
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	X-PLOR 2.1	Depositor
R, $R_{free}$	0.201 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	8665	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	25.0	wwPDB-VP

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

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

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	0.84	0/1421	1.40	16/1911 (0.8%)
1	B	0.85	0/1421	1.39	13/1911 (0.7%)
1	C	0.86	0/1421	1.43	17/1911 (0.9%)
1	D	0.81	0/1421	1.41	15/1911 (0.8%)
1	E	0.83	0/1421	1.30	10/1911 (0.5%)
1	F	0.80	0/1421	1.36	14/1911 (0.7%)
All	All	0.83	0/8526	1.38	85/11466 (0.7%)

There are no bond length outliers.

All (85) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	168	ARG	NE-CZ-NH1	10.98	125.79	120.30
1	C	168	ARG	NE-CZ-NH1	10.04	125.32	120.30
1	F	168	ARG	NE-CZ-NH1	9.47	125.04	120.30
1	B	64	ARG	NE-CZ-NH1	9.15	124.88	120.30
1	C	96	MET	CG-SD-CE	-8.96	85.87	100.20
1	F	39	ARG	NE-CZ-NH1	8.90	124.75	120.30
1	F	89	TRP	CD1-CG-CD2	8.75	113.30	106.30
1	A	168	ARG	NE-CZ-NH1	8.52	124.56	120.30
1	A	59	ARG	NE-CZ-NH1	8.32	124.46	120.30
1	D	89	TRP	CD1-CG-CD2	8.29	112.94	106.30
1	C	59	ARG	NE-CZ-NH1	8.23	124.42	120.30
1	C	89	TRP	CD1-CG-CD2	8.23	112.89	106.30
1	B	39	ARG	CB-CG-CD	-8.21	90.25	111.60
1	A	64	ARG	NE-CZ-NH1	8.15	124.38	120.30
1	E	39	ARG	CB-CG-CD	-8.14	90.42	111.60
1	D	25	ARG	NE-CZ-NH1	8.11	124.35	120.30
1	E	89	TRP	CD1-CG-CD2	7.87	112.60	106.30
1	D	89	TRP	CE2-CD2-CG	-7.81	101.05	107.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	89	TRP	CD1-CG-CD2	7.78	112.52	106.30
1	D	39	ARG	CB-CG-CD	-7.75	91.46	111.60
1	C	64	ARG	NE-CZ-NH1	7.63	124.12	120.30
1	F	59	ARG	NE-CZ-NH1	7.58	124.09	120.30
1	F	89	TRP	CE2-CD2-CG	-7.58	101.24	107.30
1	C	89	TRP	CE2-CD2-CG	-7.57	101.25	107.30
1	C	39	ARG	CB-CG-CD	-7.57	91.92	111.60
1	D	59	ARG	NE-CZ-NH1	7.49	124.05	120.30
1	D	39	ARG	NE-CZ-NH1	7.48	124.04	120.30
1	C	39	ARG	NE-CZ-NH1	7.47	124.04	120.30
1	F	39	ARG	CB-CG-CD	-7.44	92.26	111.60
1	E	89	TRP	CE2-CD2-CG	-7.29	101.47	107.30
1	D	18	ARG	NE-CZ-NH1	7.28	123.94	120.30
1	A	39	ARG	CB-CG-CD	-7.27	92.70	111.60
1	B	89	TRP	CE2-CD2-CG	-7.24	101.51	107.30
1	A	59	ARG	NE-CZ-NH2	-7.04	116.78	120.30
1	B	89	TRP	CD1-CG-CD2	7.00	111.90	106.30
1	B	59	ARG	NE-CZ-NH2	-6.93	116.83	120.30
1	A	96	MET	CG-SD-CE	-6.89	89.18	100.20
1	C	75	ARG	NE-CZ-NH2	-6.77	116.91	120.30
1	C	59	ARG	NE-CZ-NH2	-6.68	116.96	120.30
1	B	59	ARG	NE-CZ-NH1	6.63	123.62	120.30
1	D	49	HIS	CA-CB-CG	-6.62	102.34	113.60
1	D	153	ARG	NE-CZ-NH1	6.61	123.60	120.30
1	A	89	TRP	CE2-CD2-CG	-6.58	102.04	107.30
1	B	75	ARG	NE-CZ-NH2	-6.56	117.02	120.30
1	C	153	ARG	NE-CZ-NH1	6.54	123.57	120.30
1	E	39	ARG	NE-CZ-NH1	6.54	123.57	120.30
1	D	18	ARG	NE-CZ-NH2	-6.48	117.06	120.30
1	D	64	ARG	NE-CZ-NH1	6.36	123.48	120.30
1	E	59	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	D	168	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	C	49	HIS	CA-CB-CG	-6.17	103.11	113.60
1	A	89	TRP	CG-CD2-CE3	6.15	139.44	133.90
1	D	59	ARG	NE-CZ-NH2	-6.08	117.26	120.30
1	A	153	ARG	NE-CZ-NH1	6.04	123.32	120.30
1	B	39	ARG	NE-CZ-NH1	6.01	123.30	120.30
1	D	28	TYR	CB-CG-CD2	-6.01	117.40	121.00
1	B	142	LYS	CA-CB-CG	-5.90	100.41	113.40
1	F	96	MET	CG-SD-CE	-5.90	90.77	100.20
1	C	168	ARG	NE-CZ-NH2	-5.86	117.37	120.30
1	F	28	TYR	CB-CG-CD2	-5.86	117.48	121.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	96	MET	CG-SD-CE	-5.84	90.86	100.20
1	C	36	TYR	CB-CG-CD2	-5.76	117.55	121.00
1	A	39	ARG	NE-CZ-NH1	5.70	123.15	120.30
1	C	142	LYS	CA-CB-CG	-5.69	100.88	113.40
1	A	75	ARG	NE-CZ-NH1	5.64	123.12	120.30
1	B	28	TYR	CB-CG-CD2	-5.61	117.64	121.00
1	A	49	HIS	CA-CB-CG	-5.61	104.07	113.60
1	B	8	TYR	CB-CG-CD1	-5.60	117.64	121.00
1	E	142	LYS	CA-CB-CG	-5.58	101.12	113.40
1	A	89	TRP	CG-CD1-NE1	-5.52	104.58	110.10
1	C	75	ARG	NE-CZ-NH1	5.46	123.03	120.30
1	F	89	TRP	CG-CD1-NE1	-5.43	104.67	110.10
1	A	89	TRP	CB-CG-CD1	-5.37	120.02	127.00
1	B	96	MET	CG-SD-CE	-5.29	91.73	100.20
1	E	155	VAL	CA-CB-CG2	-5.25	103.02	110.90
1	F	18	ARG	NE-CZ-NH2	-5.18	117.71	120.30
1	F	89	TRP	CB-CG-CD1	-5.17	120.28	127.00
1	E	168	ARG	NE-CZ-NH1	5.17	122.88	120.30
1	F	142	LYS	CA-CB-CG	-5.16	102.04	113.40
1	F	171	LEU	O-C-N	-5.16	114.44	122.70
1	E	64	ARG	NE-CZ-NH1	5.15	122.87	120.30
1	F	153	ARG	NE-CZ-NH1	5.10	122.85	120.30
1	E	153	ARG	NE-CZ-NH1	5.09	122.84	120.30
1	C	18	ARG	NE-CZ-NH2	-5.06	117.77	120.30
1	A	75	ARG	NE-CZ-NH2	-5.02	117.79	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-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 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	1398	0	1377	10	0
1	B	1398	0	1376	15	0
1	C	1398	0	1377	15	0
1	D	1398	0	1377	12	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	1398	0	1377	14	0
1	F	1398	0	1377	19	0
2	A	1	0	0	0	0
2	B	2	0	0	0	0
2	D	2	0	0	0	0
3	A	51	0	0	1	0
3	B	52	0	0	2	0
3	C	49	0	0	1	0
3	D	38	0	0	0	0
3	E	39	0	0	1	0
3	F	43	0	0	0	0
All	All	8665	0	8261	73	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 4.

All (73) 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:B:71:GLN:HA	1:C:142:LYS:HD2	1.59	0.84
1:D:142:LYS:HD2	1:F:71:GLN:HA	1.61	0.80
1:A:142:LYS:HD2	1:C:71:GLN:HA	1.64	0.79
1:A:71:GLN:HA	1:B:142:LYS:HD2	1.64	0.78
1:D:71:GLN:HA	1:E:142:LYS:HD2	1.66	0.76
1:C:149:THR:HG21	1:E:41:ASP:HA	1.72	0.71
1:E:71:GLN:HA	1:F:142:LYS:HD2	1.72	0.70
1:B:41:ASP:HA	1:F:149:THR:HG21	1.75	0.68
1:E:150:ASN:ND2	1:E:153:ARG:HH11	1.94	0.66
1:F:150:ASN:ND2	1:F:153:ARG:HH11	1.97	0.62
1:B:150:ASN:ND2	1:B:153:ARG:HH11	1.99	0.60
1:A:150:ASN:ND2	1:A:153:ARG:HH11	2.00	0.60
1:C:150:ASN:ND2	1:C:153:ARG:HH11	2.01	0.59
1:F:56:GLU:HG3	1:F:59:ARG:HH21	1.70	0.57
1:F:170:THR:O	1:F:174:ASP:HB3	2.05	0.57
1:E:20:VAL:HG21	1:E:66:LEU:HD13	1.88	0.56
1:D:170:THR:O	1:D:174:ASP:HB3	2.08	0.54
1:E:170:THR:O	1:E:174:ASP:HB3	2.06	0.54
1:B:170:THR:O	1:B:174:ASP:HB3	2.07	0.54
1:C:154:LEU:HD21	1:E:164:TYR:CD2	2.42	0.54
1:D:19:LEU:HD21	1:D:110:LEU:HD23	1.89	0.53
1:C:170:THR:O	1:C:174:ASP:HB3	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:135:ASP:OD2	1:C:139:LYS:HE2	2.10	0.52
1:D:150:ASN:ND2	1:D:153:ARG:HH11	2.08	0.51
1:E:149:THR:HG22	3:E:353:HOH:O	2.10	0.51
1:C:20:VAL:HG21	1:C:66:LEU:HD13	1.93	0.50
1:A:170:THR:O	1:A:174:ASP:HB3	2.10	0.50
1:D:117:GLY:HA3	1:D:125:LEU:HD23	1.93	0.49
1:A:24:LEU:HD13	1:A:62:ALA:CB	2.43	0.49
1:A:25:ARG:NH1	1:A:84:PRO:HA	2.27	0.49
1:F:19:LEU:HD21	1:F:110:LEU:HD23	1.93	0.49
1:D:20:VAL:HG21	1:D:66:LEU:HD13	1.95	0.48
1:A:20:VAL:HG21	1:A:66:LEU:HD13	1.94	0.48
1:C:117:GLY:HA3	1:C:125:LEU:HD23	1.95	0.48
1:E:150:ASN:ND2	1:E:153:ARG:NH1	2.61	0.48
1:B:20:VAL:HG21	1:B:66:LEU:HD13	1.94	0.48
1:C:56:GLU:HG3	1:C:59:ARG:HH21	1.79	0.47
1:E:24:LEU:HD13	1:E:62:ALA:CB	2.44	0.47
1:F:24:LEU:HD13	1:F:62:ALA:CB	2.45	0.47
1:B:164:TYR:CD2	1:F:154:LEU:HD21	2.51	0.46
1:D:56:GLU:HG3	1:D:59:ARG:HH21	1.81	0.45
1:F:39:ARG:HD3	1:F:41:ASP:OD1	2.17	0.45
1:C:149:THR:HG21	1:E:40:ASP:O	2.16	0.45
1:B:75:ARG:NH2	3:B:562:HOH:O	2.49	0.45
1:B:64:ARG:HH11	1:B:64:ARG:HG3	1.82	0.45
1:B:164:TYR:O	1:B:168:ARG:HB2	2.17	0.44
1:B:97:LYS:O	1:B:100:ILE:HG22	2.17	0.44
1:C:19:LEU:HD21	1:C:110:LEU:HD23	1.99	0.44
1:C:24:LEU:HD13	1:C:62:ALA:CB	2.48	0.44
1:C:67:LYS:O	1:C:71:GLN:HG3	2.17	0.44
1:B:67:LYS:O	1:B:71:GLN:HG3	2.18	0.43
1:F:150:ASN:ND2	1:F:153:ARG:NH1	2.66	0.43
1:F:164:TYR:O	1:F:168:ARG:HB2	2.19	0.43
1:D:24:LEU:HD13	1:D:62:ALA:CB	2.49	0.43
1:D:56:GLU:HG3	1:D:59:ARG:NH2	2.34	0.43
1:E:19:LEU:HD21	1:E:110:LEU:HD23	2.00	0.43
1:B:72:ARG:NH1	3:B:375:HOH:O	2.50	0.43
1:B:40:ASP:O	1:F:149:THR:HG21	2.19	0.42
1:A:75:ARG:NH2	3:A:561:HOH:O	2.51	0.42
1:E:25:ARG:HE	1:E:82:GLN:HB2	1.84	0.42
1:F:147:HIS:O	1:F:151:ILE:HG13	2.19	0.42
1:F:166:PHE:CE2	1:F:171:LEU:HD22	2.55	0.41
1:F:97:LYS:HG3	1:F:148:LEU:HD21	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:20:VAL:HG21	1:F:66:LEU:HD13	2.02	0.41
1:C:164:TYR:O	1:C:168:ARG:HB2	2.20	0.41
1:B:150:ASN:ND2	1:B:153:ARG:NH1	2.69	0.40
1:F:67:LYS:O	1:F:71:GLN:HG3	2.22	0.40
1:E:164:TYR:O	1:E:168:ARG:HB2	2.21	0.40
1:A:39:ARG:HD3	1:A:41:ASP:OD1	2.22	0.40
1:D:155:VAL:HA	1:D:159:ALA:HA	2.04	0.40
1:D:147:HIS:O	1:D:151:ILE:HG13	2.20	0.40
1:F:133:PHE:O	1:F:137:GLU:HB2	2.21	0.40
1:A:149:THR:HG22	3:C:351:HOH:O	2.21	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	172/174 (99%)	168 (98%)	2 (1%)	2 (1%)	16	33
1	B	172/174 (99%)	169 (98%)	3 (2%)	0	100	100
1	C	172/174 (99%)	167 (97%)	5 (3%)	0	100	100
1	D	172/174 (99%)	169 (98%)	2 (1%)	1 (1%)	30	56
1	E	172/174 (99%)	167 (97%)	4 (2%)	1 (1%)	30	56
1	F	172/174 (99%)	167 (97%)	4 (2%)	1 (1%)	30	56
All	All	1032/1044 (99%)	1007 (98%)	20 (2%)	5 (0%)	34	60

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	3	GLN
1	E	3	GLN

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Mol	Chain	Res	Type
1	D	3	GLN
1	F	3	GLN
1	A	157	SER

### 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	148/148 (100%)	129 (87%)	19 (13%)	5	10
1	B	148/148 (100%)	130 (88%)	18 (12%)	6	11
1	C	148/148 (100%)	128 (86%)	20 (14%)	5	8
1	D	148/148 (100%)	129 (87%)	19 (13%)	5	10
1	E	148/148 (100%)	132 (89%)	16 (11%)	8	15
1	F	148/148 (100%)	128 (86%)	20 (14%)	5	8
All	All	888/888 (100%)	776 (87%)	112 (13%)	5	10

All (112) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	LEU
1	A	25	ARG
1	A	44	LEU
1	A	48	CYS
1	A	56	GLU
1	A	66	LEU
1	A	75	ARG
1	A	81	LEU
1	A	104	LYS
1	A	106	LEU
1	A	111	LEU
1	A	116	LEU
1	A	118	SER
1	A	129	LEU
1	A	134	LEU

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Mol	Chain	Res	Type
1	A	158	GLN
1	A	168	ARG
1	A	171	LEU
1	A	174	ASP
1	B	18	ARG
1	B	24	LEU
1	B	44	LEU
1	B	64	ARG
1	B	66	LEU
1	B	75	ARG
1	B	81	LEU
1	B	104	LYS
1	B	106	LEU
1	B	111	LEU
1	B	116	LEU
1	B	118	SER
1	B	129	LEU
1	B	134	LEU
1	B	158	GLN
1	B	168	ARG
1	B	171	LEU
1	B	174	ASP
1	C	10	THR
1	C	18	ARG
1	C	24	LEU
1	C	44	LEU
1	C	48	CYS
1	C	49	HIS
1	C	66	LEU
1	C	75	ARG
1	C	81	LEU
1	C	104	LYS
1	C	106	LEU
1	C	111	LEU
1	C	116	LEU
1	C	118	SER
1	C	129	LEU
1	C	134	LEU
1	C	158	GLN
1	C	168	ARG
1	C	171	LEU
1	C	174	ASP

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Mol	Chain	Res	Type
1	D	10	THR
1	D	24	LEU
1	D	44	LEU
1	D	49	HIS
1	D	66	LEU
1	D	75	ARG
1	D	81	LEU
1	D	104	LYS
1	D	106	LEU
1	D	111	LEU
1	D	116	LEU
1	D	118	SER
1	D	127	ASP
1	D	129	LEU
1	D	134	LEU
1	D	158	GLN
1	D	168	ARG
1	D	171	LEU
1	D	174	ASP
1	E	24	LEU
1	E	28	TYR
1	E	44	LEU
1	E	56	GLU
1	E	66	LEU
1	E	75	ARG
1	E	81	LEU
1	E	104	LYS
1	E	106	LEU
1	E	111	LEU
1	E	116	LEU
1	E	129	LEU
1	E	134	LEU
1	E	168	ARG
1	E	171	LEU
1	E	174	ASP
1	F	24	LEU
1	F	25	ARG
1	F	28	TYR
1	F	44	LEU
1	F	48	CYS
1	F	49	HIS
1	F	56	GLU

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Mol	Chain	Res	Type
1	F	66	LEU
1	F	75	ARG
1	F	81	LEU
1	F	104	LYS
1	F	106	LEU
1	F	111	LEU
1	F	116	LEU
1	F	118	SER
1	F	129	LEU
1	F	134	LEU
1	F	168	ARG
1	F	171	LEU
1	F	174	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	150	ASN
1	B	49	HIS
1	B	107	ASN
1	B	150	ASN
1	C	3	GLN
1	C	71	GLN
1	C	150	ASN
1	D	107	ASN
1	D	150	ASN
1	E	150	ASN
1	F	150	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 5 ligands modelled in this entry, 5 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 ⓘ

EDS was not executed - this section will therefore be empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

EDS was not executed - this section will therefore be empty.

### 6.3 Carbohydrates ⓘ

EDS was not executed - this section will therefore be empty.

### 6.4 Ligands ⓘ

EDS was not executed - this section will therefore be empty.

### 6.5 Other polymers ⓘ

EDS was not executed - this section will therefore be empty.