



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 15, 2023 – 07:18 PM EDT

PDB ID : 1T4K  
Title : Crystal Structure of Unliganded Aldolase Antibody 93F3 Fab  
Authors : Zhu, X.; Wilson, I.A.  
Deposited on : 2004-04-29  
Resolution : 2.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
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) : 2.35

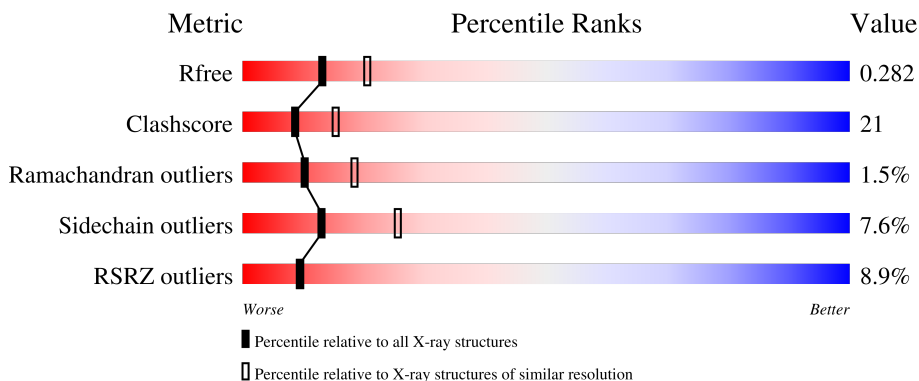
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	217	<div style="display: flex; align-items: center;"> <div style="width: 9%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 49%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 40%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">9%      58%      40%      .</p>
1	C	217	<div style="display: flex; align-items: center;"> <div style="width: 13%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 43%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 41%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">13%      56%      41%      .</p>
2	B	217	<div style="display: flex; align-items: center;"> <div style="width: 7%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 60%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 7%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">7%      67%      26%      7%</p>
2	D	217	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 58%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 30%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 10px;">6%      64%      30%      6%</p>

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 6882 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 IMMUNOGLOBULIN IGG1, KAPPA LIGHT CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	217	1693	1052	287	347	7	0	0	0
1	C	217	1693	1052	287	347	7	0	0	0

- Molecule 2 is a protein called IMMUNOGLOBULIN IGG1, HEAVY CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	217	1605	1015	262	320	8	0	0	0
2	D	217	1605	1015	262	320	8	0	0	0

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Zn 2	0	0
3	B	3	Total 3	Zn 3	0	0
3	C	3	Total 3	Zn 3	0	0
3	D	1	Total 1	Zn 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	63	Total 63	O 63	0	0
4	B	74	Total 74	O 74	0	0

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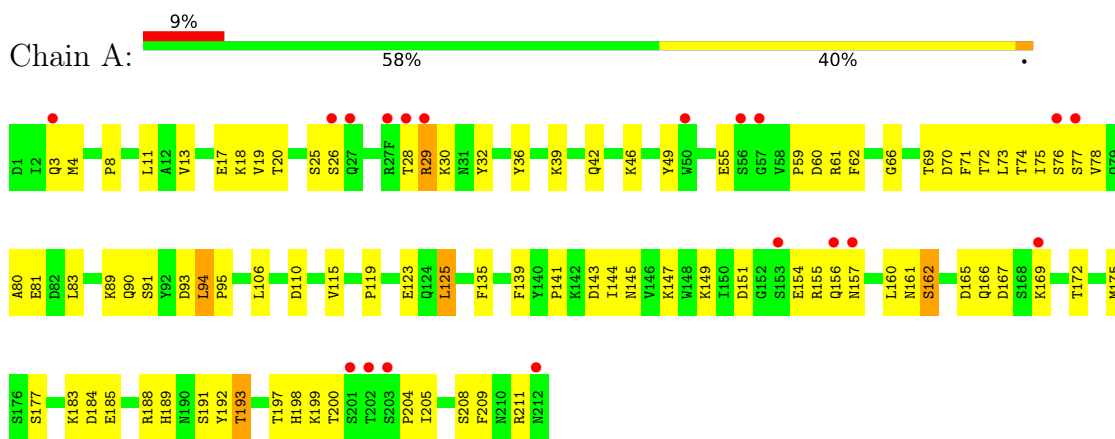
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	C	57	Total	O	0	0
			57	57		
4	D	83	Total	O	0	0
			83	83		

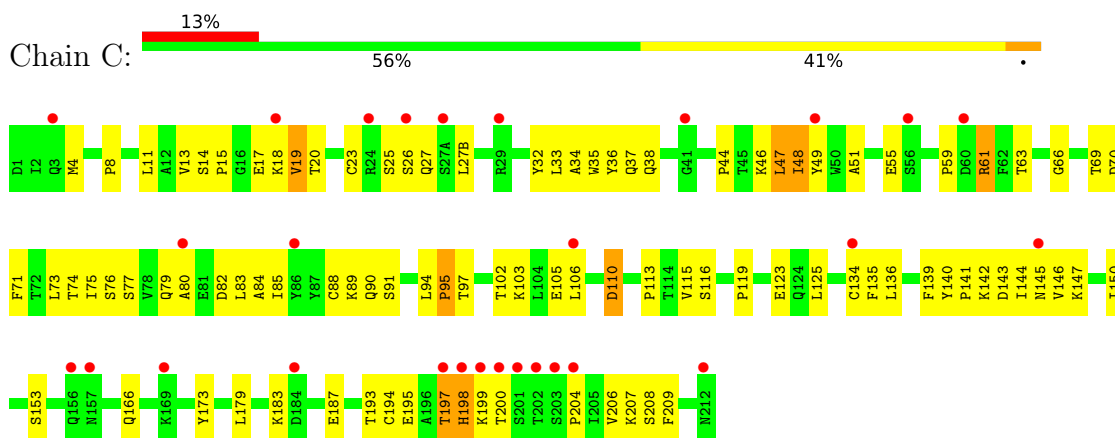
### 3 Residue-property plots [i](#)

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.

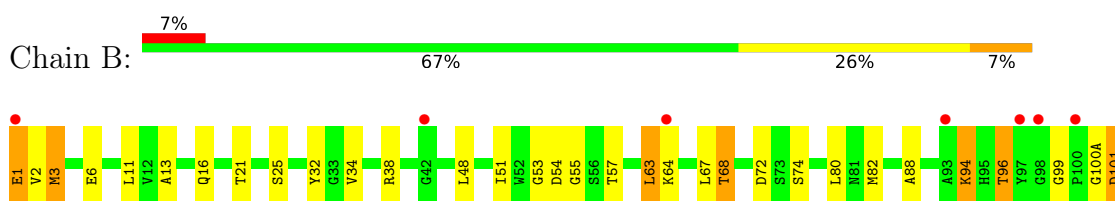
- Molecule 1: IMMUNOGLOBULIN IGG1, KAPPA LIGHT CHAIN



- Molecule 1: IMMUNOGLOBULIN IGG1, KAPPA LIGHT CHAIN

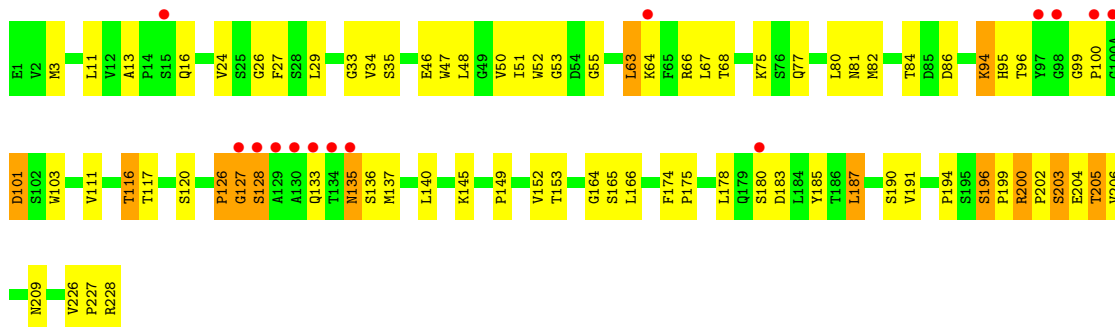


- Molecule 2: IMMUNOGLOBULIN IGG1, HEAVY CHAIN





● Molecule 2: IMMUNOGLOBULIN IGG1, HEAVY CHAIN



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	79.70Å 81.23Å 149.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.50 19.99 – 2.50	Depositor EDS
% Data completeness (in resolution range)	89.1 (50.00-2.50) 89.0 (19.99-2.50)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.53 (at 2.50Å)	Xtrriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.233 , 0.281 0.233 , 0.282	Depositor DCC
$R_{free}$ test set	1370 reflections (4.47%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	49.4	Xtrriage
Anisotropy	0.118	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 58.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.000 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	6882	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 47.75 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.4850e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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	0.44	0/1731	0.68	0/2347
1	C	0.44	0/1731	0.66	0/2347
2	B	0.54	1/1649 (0.1%)	0.73	2/2256 (0.1%)
2	D	0.62	1/1649 (0.1%)	0.77	0/2256
All	All	0.51	2/6760 (0.0%)	0.71	2/9206 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	127	GLY	N-CA	7.61	1.57	1.46
2	B	1	GLU	CD-OE2	7.17	1.33	1.25

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	142	CYS	CA-CB-SG	5.28	123.51	114.00
2	B	54	ASP	CB-CG-OD1	5.01	122.81	118.30

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	1693	0	1629	69	0
1	C	1693	0	1628	91	0
2	B	1605	0	1570	55	0
2	D	1605	0	1570	65	0
3	A	2	0	0	0	0
3	B	3	0	0	0	0
3	C	3	0	0	0	0
3	D	1	0	0	0	0
4	A	63	0	0	2	0
4	B	74	0	0	3	0
4	C	57	0	0	3	0
4	D	83	0	0	7	0
All	All	6882	0	6397	268	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 21.

All (268) 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:144:ILE:HG13	1:C:198:HIS:HB3	1.34	1.02
1:A:3:GLN:HG2	1:A:26:SER:HB3	1.43	0.99
2:D:126:PRO:O	2:D:228:ARG:HD2	1.70	0.92
2:B:194:PRO:O	2:B:199:PRO:HD2	1.72	0.88
1:A:145:ASN:HD21	1:A:197:THR:HB	1.35	0.88
1:A:80:ALA:HA	1:A:106:LEU:HD21	1.53	0.88
1:A:110:ASP:HB3	1:A:200:THR:HG22	1.58	0.84
1:C:195:GLU:HG2	1:C:206:VAL:HG22	1.59	0.84
2:D:133:GLN:HG2	2:D:135:ASN:ND2	1.96	0.80
2:B:2:VAL:O	2:B:3:MET:HG2	1.83	0.79
1:A:4:MET:HE1	1:A:90:GLN:HB3	1.65	0.78
1:C:198:HIS:CE1	1:C:200:THR:HB	2.20	0.76
1:C:183:LYS:O	1:C:187:GLU:HG3	1.85	0.76
4:C:351:HOH:O	2:D:100:PRO:HB3	1.86	0.74
2:D:95:HIS:CE1	4:D:333:HOH:O	2.41	0.74
1:C:83:LEU:HD11	1:C:166:GLN:HB3	1.70	0.73
2:B:113:SER:OG	2:D:26:GLY:HA2	1.89	0.73
2:B:51:ILE:HD12	2:B:57:THR:HG22	1.71	0.73
1:C:206:VAL:O	1:C:207:LYS:HD2	1.88	0.72
1:A:193:THR:HB	1:A:208:SER:HB3	1.72	0.71
2:D:194:PRO:HB2	2:D:199:PRO:HD2	1.73	0.71
2:D:47:TRP:CZ2	2:D:50:VAL:HG23	2.26	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:13:VAL:O	1:C:106:LEU:HD12	1.93	0.68
2:B:3:MET:HB2	2:B:25:SER:HB2	1.75	0.68
1:C:197:THR:OG1	1:C:204:PRO:HB3	1.94	0.68
2:D:200:ARG:HD2	2:D:202:PRO:HA	1.75	0.68
1:C:20:THR:HG22	1:C:74:THR:OG1	1.94	0.67
2:D:35:SER:CB	2:D:50:VAL:HG22	2.24	0.67
2:D:133:GLN:HG2	2:D:135:ASN:HD22	1.58	0.66
2:B:127:GLY:O	2:B:128:SER:HB3	1.94	0.66
1:C:193:THR:HG23	1:C:208:SER:HB2	1.75	0.66
2:B:48:LEU:HD22	2:B:63:LEU:HD21	1.75	0.66
2:D:47:TRP:HZ2	2:D:50:VAL:HG23	1.60	0.66
2:D:153:THR:HG22	4:D:339:HOH:O	1.96	0.65
1:A:192:TYR:O	1:A:208:SER:HB2	1.97	0.65
1:A:151:ASP:HA	1:A:191:SER:HB3	1.78	0.65
1:C:144:ILE:HG13	1:C:198:HIS:CB	2.20	0.64
1:A:39:LYS:HB2	1:A:42:GLN:HE21	1.62	0.64
2:B:205:THR:HG22	4:B:323:HOH:O	1.97	0.64
1:A:145:ASN:ND2	1:A:197:THR:HB	2.10	0.64
2:B:196:SER:HB2	2:B:199:PRO:HD3	1.79	0.63
1:A:188:ARG:O	2:D:199:PRO:HG2	1.98	0.62
2:B:178:LEU:HD12	2:B:184:LEU:O	1.99	0.62
2:D:33:GLY:HA3	2:D:52:TRP:CE3	2.33	0.62
1:A:160:LEU:HB3	2:B:177:VAL:HG21	1.81	0.62
2:D:67:LEU:HD11	2:D:80:LEU:HD11	1.83	0.61
1:A:119:PRO:HB3	1:A:209:PHE:CE2	2.36	0.61
1:C:63:THR:CG2	1:C:74:THR:HB	2.30	0.61
2:B:199:PRO:O	2:B:204:GLU:N	2.33	0.60
1:C:119:PRO:HB3	1:C:209:PHE:CE1	2.36	0.60
1:A:110:ASP:OD2	1:A:199:LYS:HE3	2.02	0.60
1:C:103:LYS:HD2	1:C:105:GLU:HG3	1.84	0.59
1:C:119:PRO:HB3	1:C:209:PHE:CZ	2.37	0.59
2:D:68:THR:HG23	2:D:81:ASN:HB2	1.82	0.59
1:A:167:ASP:OD1	1:A:169:LYS:HB2	2.02	0.59
2:D:187:LEU:C	2:D:187:LEU:HD12	2.23	0.59
1:C:33:LEU:C	1:C:33:LEU:HD23	2.22	0.58
1:C:48:ILE:HD11	1:C:51:ALA:O	2.03	0.58
2:B:13:ALA:O	2:B:16:GLN:HB2	2.03	0.58
1:C:115:VAL:HB	1:C:207:LYS:HG3	1.85	0.58
1:A:18:LYS:HB2	1:A:76:SER:O	2.04	0.58
1:C:17:GLU:O	1:C:77:SER:HA	2.04	0.58
1:A:119:PRO:HB3	1:A:209:PHE:CZ	2.38	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:113:PRO:HB3	1:C:139:PHE:HB3	1.85	0.57
1:C:85:ILE:HD12	1:C:102:THR:C	2.25	0.57
1:C:15:PRO:HD3	1:C:106:LEU:HD11	1.87	0.57
2:B:94:LYS:O	2:B:101:ASP:HA	2.05	0.57
1:A:13:VAL:CG1	1:A:78:VAL:HG21	2.34	0.57
1:A:13:VAL:HG11	1:A:78:VAL:HG21	1.86	0.56
2:D:196:SER:CB	2:D:199:PRO:HD3	2.36	0.56
1:C:8:PRO:CG	1:C:11:LEU:HG	2.35	0.56
1:C:80:ALA:HA	1:C:106:LEU:HD22	1.88	0.56
1:C:25:SER:O	1:C:69:THR:HG23	2.06	0.55
1:C:135:PHE:CE2	2:D:190:SER:HB3	2.40	0.55
1:A:185:GLU:OE2	1:A:189:HIS:NE2	2.40	0.55
2:B:80:LEU:HD21	2:B:82:MET:HG3	1.86	0.55
1:C:197:THR:HG23	1:C:204:PRO:HB3	1.88	0.55
2:D:11:LEU:HD23	2:D:116:THR:HG22	1.88	0.55
1:A:13:VAL:HG22	1:A:17:GLU:HB2	1.88	0.55
2:B:144:VAL:HB	2:B:187:LEU:HD22	1.89	0.55
2:D:94:LYS:O	2:D:101:ASP:HA	2.07	0.55
1:A:169:LYS:HD3	4:A:334:HOH:O	2.06	0.55
2:B:194:PRO:C	2:B:199:PRO:HD2	2.28	0.54
1:C:35:TRP:HB2	1:C:48:ILE:HG23	1.88	0.54
1:A:125:LEU:HD12	1:A:183:LYS:HG3	1.89	0.54
1:A:139:PHE:O	1:A:172:THR:HB	2.08	0.54
1:C:4:MET:HE3	1:C:23:CYS:SG	2.47	0.54
2:D:13:ALA:O	2:D:16:GLN:HB2	2.08	0.54
2:D:194:PRO:HB2	2:D:199:PRO:CD	2.36	0.54
1:A:61:ARG:O	1:A:75:ILE:HA	2.08	0.54
2:D:84:THR:HA	2:D:111:VAL:HB	1.89	0.54
1:C:75:ILE:HD12	1:C:75:ILE:N	2.23	0.54
1:C:79:GLN:NE2	4:C:321:HOH:O	2.40	0.54
1:C:125:LEU:O	1:C:183:LYS:HD2	2.06	0.54
1:C:13:VAL:HG11	1:C:19:VAL:HG11	1.89	0.53
1:A:184:ASP:O	1:A:188:ARG:HG3	2.09	0.53
1:A:193:THR:HB	1:A:208:SER:CB	2.38	0.53
2:D:178:LEU:HB2	2:D:185:TYR:CE1	2.43	0.53
2:D:226:VAL:HG22	4:D:310:HOH:O	2.07	0.53
2:D:95:HIS:CD2	2:D:96:THR:H	2.27	0.53
2:D:35:SER:OG	2:D:50:VAL:HG22	2.09	0.53
1:C:150:ILE:HD11	1:C:179:LEU:HD21	1.91	0.53
2:D:66:ARG:NH2	2:D:86:ASP:OD2	2.42	0.52
2:B:115:SER:O	2:B:117:THR:HG22	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:LYS:HD3	1:A:154:GLU:OE1	2.10	0.52
2:D:180:SER:O	2:D:183:ASP:HB2	2.10	0.52
1:C:8:PRO:HG2	1:C:11:LEU:HG	1.92	0.52
1:A:17:GLU:O	1:A:77:SER:HA	2.11	0.51
1:A:83:LEU:HD11	1:A:166:GLN:HB3	1.90	0.51
1:A:141:PRO:HD2	1:A:198:HIS:CE1	2.45	0.51
2:B:80:LEU:C	2:B:80:LEU:HD23	2.30	0.51
1:C:38:GLN:HB3	1:C:85:ILE:HG23	1.91	0.51
1:A:25:SER:O	1:A:69:THR:HG23	2.10	0.51
2:B:11:LEU:HD23	2:B:116:THR:HG22	1.92	0.51
2:D:194:PRO:O	2:D:199:PRO:HD2	2.10	0.51
1:A:32:TYR:HB3	1:A:91:SER:HB2	1.93	0.51
2:B:103:TRP:CD1	2:B:103:TRP:N	2.79	0.51
1:A:59:PRO:HG2	1:A:62:PHE:CD2	2.47	0.50
1:C:142:LYS:HB2	1:C:173:TYR:CE1	2.46	0.50
1:A:184:ASP:HB2	2:D:165:SER:OG	2.12	0.50
1:C:103:LYS:HD2	1:C:105:GLU:CG	2.41	0.50
1:C:48:ILE:HD11	1:C:51:ALA:C	2.32	0.50
1:C:90:GLN:HE21	1:C:97:THR:HB	1.77	0.50
2:D:51:ILE:HG23	2:D:51:ILE:O	2.12	0.50
1:C:20:THR:HA	1:C:73:LEU:O	2.12	0.50
1:C:27(B):LEU:HD12	1:C:71:PHE:CE1	2.46	0.50
1:A:8:PRO:HG2	1:A:11:LEU:HG	1.93	0.50
1:C:139:PHE:CE2	1:C:144:ILE:HB	2.47	0.50
1:C:18:LYS:HB2	1:C:76:SER:O	2.12	0.49
2:D:35:SER:HB3	2:D:50:VAL:HG22	1.94	0.49
1:C:83:LEU:C	1:C:83:LEU:HD23	2.33	0.49
2:B:119:PRO:HB3	2:B:147:TYR:HB3	1.94	0.49
2:B:119:PRO:HB2	2:B:144:VAL:HG13	1.95	0.49
1:C:36:TYR:HE2	1:C:89:LYS:HD3	1.78	0.49
1:C:197:THR:CG2	1:C:204:PRO:HB3	2.43	0.49
2:D:33:GLY:HA3	2:D:52:TRP:CZ3	2.48	0.48
2:D:48:LEU:HD22	2:D:63:LEU:HD21	1.95	0.48
2:B:126:PRO:HD3	2:B:140:LEU:CD1	2.44	0.48
1:C:115:VAL:HB	1:C:207:LYS:CG	2.43	0.48
1:C:13:VAL:HG11	1:C:19:VAL:CG1	2.43	0.48
2:D:11:LEU:HB2	2:D:149:PRO:HG3	1.96	0.48
1:A:162:SER:O	1:A:175:MET:HA	2.13	0.48
2:B:144:VAL:HB	2:B:187:LEU:CD2	2.43	0.48
2:D:135:ASN:OD1	2:D:137:MET:O	2.32	0.47
1:A:149:LYS:NZ	4:A:348:HOH:O	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:32:TYR:CD1	2:B:96:THR:HG23	2.49	0.47
1:C:8:PRO:HG3	1:C:11:LEU:HG	1.97	0.47
1:A:66:GLY:HA3	1:A:71:PHE:HA	1.97	0.47
1:A:78:VAL:HG23	1:A:78:VAL:O	2.15	0.47
1:C:4:MET:CE	1:C:90:GLN:HB3	2.44	0.47
2:D:46:GLU:HA	4:D:343:HOH:O	2.15	0.47
2:D:68:THR:CG2	2:D:81:ASN:HB2	2.43	0.47
2:B:187:LEU:HA	4:B:339:HOH:O	2.14	0.47
1:C:61:ARG:NH2	1:C:82:ASP:OD1	2.47	0.47
2:B:178:LEU:HD21	4:B:378:HOH:O	2.15	0.47
2:D:127:GLY:O	2:D:128:SER:HB2	2.15	0.47
1:A:20:THR:HA	1:A:73:LEU:O	2.14	0.46
1:C:26:SER:C	1:C:27:GLN:HG3	2.35	0.46
1:C:110:ASP:OD2	1:C:199:LYS:HG2	2.15	0.46
1:C:135:PHE:CZ	2:D:190:SER:HB3	2.50	0.46
1:C:66:GLY:HA3	1:C:71:PHE:HA	1.97	0.46
1:C:46:LYS:HD3	1:C:49:TYR:HB3	1.97	0.46
2:D:95:HIS:ND1	4:D:370:HOH:O	2.35	0.46
1:A:149:LYS:O	1:A:193:THR:HG23	2.16	0.46
1:C:33:LEU:HD23	1:C:34:ALA:N	2.30	0.46
1:C:34:ALA:O	1:C:88:CYS:HA	2.16	0.46
1:C:141:PRO:HB2	1:C:143:ASP:OD1	2.15	0.46
1:A:28:THR:O	1:A:30:LYS:HG2	2.15	0.46
2:D:199:PRO:O	2:D:204:GLU:N	2.40	0.46
2:B:114:ALA:HB3	2:B:148:PHE:CE2	2.51	0.45
1:C:20:THR:HG22	1:C:74:THR:HG23	1.97	0.45
1:C:61:ARG:O	1:C:75:ILE:HA	2.16	0.45
2:B:152:VAL:HG12	2:B:187:LEU:HD13	1.98	0.45
1:C:37:GLN:HB2	1:C:47:LEU:HD22	1.97	0.45
1:C:49:TYR:CE2	2:D:99:GLY:HA2	2.51	0.45
2:D:145:LYS:HB2	2:D:145:LYS:HE3	1.75	0.45
2:D:202:PRO:HG3	2:D:227:PRO:HG3	1.98	0.45
1:A:144:ILE:HB	1:A:198:HIS:HD2	1.81	0.45
2:B:53:GLY:C	2:B:55:GLY:H	2.20	0.45
2:B:122:PHE:HA	2:B:123:PRO:HD3	1.76	0.45
1:C:83:LEU:O	1:C:84:ALA:HB2	2.17	0.45
1:C:195:GLU:CG	1:C:206:VAL:HG22	2.40	0.45
1:A:8:PRO:CG	1:A:11:LEU:HG	2.47	0.45
1:C:32:TYR:HB3	1:C:91:SER:HB3	1.99	0.45
1:C:59:PRO:HB2	1:C:61:ARG:HD3	1.99	0.45
2:D:86:ASP:HB2	2:D:111:VAL:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:20:THR:HG22	1:A:74:THR:OG1	2.17	0.44
1:A:197:THR:OG1	1:A:204:PRO:HB3	2.17	0.44
2:B:67:LEU:HD12	2:B:68:THR:N	2.32	0.44
2:D:34:VAL:O	2:D:51:ILE:HG22	2.17	0.44
1:A:49:TYR:CE2	2:B:99:GLY:HA2	2.53	0.44
1:C:46:LYS:HE2	4:D:330:HOH:O	2.17	0.44
2:B:38:ARG:HG3	2:B:88:ALA:HB3	2.00	0.44
2:B:72:ASP:OD1	2:B:74:SER:HB2	2.17	0.44
1:C:23:CYS:HB2	1:C:35:TRP:CH2	2.52	0.44
1:C:63:THR:HG23	1:C:74:THR:HB	1.99	0.44
1:A:89:LYS:HE3	1:A:95:PRO:HB3	2.00	0.44
1:A:157:ASN:N	1:A:157:ASN:HD22	2.14	0.44
2:D:67:LEU:HD12	2:D:82:MET:HG2	1.99	0.44
1:A:36:TYR:CE1	1:A:46:LYS:HB2	2.53	0.44
1:A:157:ASN:N	1:A:157:ASN:ND2	2.66	0.44
1:A:141:PRO:HD2	1:A:198:HIS:HE1	1.83	0.43
1:C:63:THR:HG22	1:C:74:THR:HB	1.99	0.43
1:C:95:PRO:HB2	2:D:47:TRP:CG	2.53	0.43
1:C:197:THR:CB	1:C:204:PRO:HB3	2.48	0.43
1:A:135:PHE:CE2	2:B:190:SER:HB3	2.54	0.43
2:B:138:VAL:HG13	2:B:138:VAL:O	2.17	0.43
2:B:194:PRO:HB2	2:B:199:PRO:CD	2.48	0.43
2:B:196:SER:CB	2:B:199:PRO:HD3	2.47	0.43
2:B:200:ARG:HE	2:B:200:ARG:HB3	1.34	0.43
2:B:174:PHE:CD1	2:B:174:PHE:N	2.86	0.43
2:B:187:LEU:C	2:B:187:LEU:HD23	2.39	0.43
1:C:193:THR:HG22	1:C:194:CYS:N	2.33	0.43
2:D:24:VAL:HB	2:D:27:PHE:CZ	2.54	0.43
1:C:47:LEU:HB3	1:C:48:ILE:HG22	1.99	0.43
1:C:115:VAL:HA	1:C:135:PHE:O	2.19	0.43
1:A:205:ILE:HD12	1:A:205:ILE:N	2.34	0.43
2:B:2:VAL:C	2:B:3:MET:HG2	2.39	0.43
1:C:146:VAL:O	1:C:147:LYS:HD2	2.18	0.43
2:B:6:GLU:HA	2:B:21:THR:O	2.19	0.43
2:B:51:ILE:HD12	2:B:57:THR:CG2	2.44	0.43
1:C:63:THR:HG23	1:C:63:THR:O	2.19	0.43
2:D:187:LEU:C	2:D:187:LEU:CD1	2.87	0.43
1:A:161:ASN:HD22	1:A:177:SER:HA	1.84	0.43
2:B:34:VAL:O	2:B:51:ILE:HG22	2.19	0.43
1:C:18:LYS:HG3	1:C:75:ILE:O	2.19	0.43
1:C:38:GLN:HB2	1:C:44:PRO:HG3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:166:LEU:HD22	2:D:191:VAL:HG21	2.01	0.43
1:A:29:ARG:CG	1:A:29:ARG:HH11	2.32	0.42
1:A:61:ARG:HG2	1:A:61:ARG:HH11	1.84	0.42
1:C:15:PRO:CD	1:C:106:LEU:HD11	2.49	0.42
1:A:8:PRO:HG3	1:A:11:LEU:HD21	2.00	0.42
1:C:193:THR:CG2	1:C:208:SER:HB2	2.47	0.42
2:D:164:GLY:HA2	4:D:317:HOH:O	2.18	0.42
1:C:116:SER:O	1:C:134:CYS:HA	2.19	0.42
2:D:24:VAL:HG21	2:D:29:LEU:HD21	2.01	0.42
2:D:75:LYS:O	2:D:77:GLN:HG3	2.19	0.42
2:D:196:SER:HB2	2:D:199:PRO:HD3	2.01	0.42
1:A:69:THR:O	1:A:69:THR:CG2	2.67	0.42
1:A:119:PRO:HG2	2:B:228:ARG:NH2	2.34	0.42
1:C:136:LEU:HD21	1:C:146:VAL:HG22	2.01	0.42
1:C:46:LYS:HE3	2:D:101:ASP:CB	2.49	0.42
1:C:14:SER:O	1:C:17:GLU:HG3	2.20	0.41
1:C:36:TYR:CE1	1:C:46:LYS:HB2	2.55	0.41
1:C:200:THR:HG23	4:C:313:HOH:O	2.18	0.41
1:A:19:VAL:HG22	1:A:78:VAL:HG11	2.00	0.41
1:A:13:VAL:CG2	1:A:17:GLU:HB2	2.49	0.41
1:A:115:VAL:HA	1:A:135:PHE:O	2.19	0.41
1:C:140:TYR:CG	1:C:141:PRO:HA	2.55	0.41
2:D:103:TRP:N	2:D:103:TRP:CD1	2.85	0.41
2:D:53:GLY:C	2:D:55:GLY:N	2.73	0.41
2:B:94:LYS:HD3	2:B:94:LYS:C	2.41	0.41
2:D:174:PHE:HA	2:D:175:PRO:HD3	1.90	0.41
2:B:194:PRO:HD2	2:B:199:PRO:HG2	2.03	0.41
1:A:156:GLN:HG3	1:A:157:ASN:ND2	2.35	0.41
2:B:100(A):GLY:O	2:B:101:ASP:C	2.59	0.41
2:B:123:PRO:HG3	2:B:221:LYS:HD2	2.01	0.41
1:A:197:THR:HA	1:A:204:PRO:HB3	2.02	0.41
1:A:211:ARG:HB3	1:A:211:ARG:NH1	2.36	0.41
1:C:139:PHE:HE2	1:C:144:ILE:HB	1.86	0.41
2:D:67:LEU:CD1	2:D:80:LEU:HD11	2.49	0.41
2:B:67:LEU:HD12	2:B:68:THR:H	1.85	0.41
2:B:127:GLY:O	2:B:128:SER:CB	2.68	0.41
1:A:93:ASP:O	1:A:94:LEU:O	2.39	0.40
2:D:200:ARG:HE	2:D:200:ARG:HB3	1.45	0.40
1:A:197:THR:CB	1:A:204:PRO:HB3	2.52	0.40
2:B:53:GLY:C	2:B:55:GLY:N	2.74	0.40
2:D:205:THR:HG23	2:D:206:VAL:N	2.36	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	215/217 (99%)	195 (91%)	18 (8%)	2 (1%)	17	31
1	C	215/217 (99%)	198 (92%)	15 (7%)	2 (1%)	17	31
2	B	215/217 (99%)	192 (89%)	18 (8%)	5 (2%)	6	10
2	D	215/217 (99%)	198 (92%)	13 (6%)	4 (2%)	8	13
All	All	860/868 (99%)	783 (91%)	64 (7%)	13 (2%)	10	18

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	143	ASP
2	B	101	ASP
2	B	127	GLY
2	B	203	SER
2	D	101	ASP
2	D	203	SER
2	D	64	LYS
2	D	128	SER
1	A	94	LEU
2	B	64	LYS
1	C	94	LEU
1	C	95	PRO
2	B	199	PRO

### 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	195/195 (100%)	183 (94%)	12 (6%)	18	35
1	C	195/195 (100%)	183 (94%)	12 (6%)	18	35
2	B	186/186 (100%)	169 (91%)	17 (9%)	9	18
2	D	186/186 (100%)	169 (91%)	17 (9%)	9	18
All	All	762/762 (100%)	704 (92%)	58 (8%)	13	25

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	ARG
1	A	55	GLU
1	A	60	ASP
1	A	70	ASP
1	A	72	THR
1	A	81	GLU
1	A	123	GLU
1	A	125	LEU
1	A	155	ARG
1	A	162	SER
1	A	165	ASP
1	A	193	THR
2	B	1	GLU
2	B	3	MET
2	B	63	LEU
2	B	68	THR
2	B	94	LYS
2	B	96	THR
2	B	116	THR
2	B	117	THR
2	B	123	PRO
2	B	145	LYS
2	B	152	VAL
2	B	153	THR
2	B	166	LEU
2	B	187	LEU
2	B	200	ARG
2	B	209	ASN
2	B	227	PRO
1	C	19	VAL

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Mol	Chain	Res	Type
1	C	47	LEU
1	C	48	ILE
1	C	55	GLU
1	C	61	ARG
1	C	70	ASP
1	C	110	ASP
1	C	123	GLU
1	C	145	ASN
1	C	153	SER
1	C	197	THR
1	C	198	HIS
2	D	3	MET
2	D	63	LEU
2	D	94	LYS
2	D	116	THR
2	D	117	THR
2	D	120	SER
2	D	126	PRO
2	D	135	ASN
2	D	136	SER
2	D	140	LEU
2	D	152	VAL
2	D	187	LEU
2	D	196	SER
2	D	200	ARG
2	D	203	SER
2	D	205	THR
2	D	209	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	GLN
1	A	137	ASN
1	A	145	ASN
1	A	161	ASN
1	A	212	ASN
2	B	81	ASN
2	B	83(C)	GLN
2	B	95	HIS
2	B	179	GLN
1	C	27	GLN

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Mol	Chain	Res	Type
1	C	90	GLN
1	C	210	ASN
1	C	212	ASN
2	D	83	HIS
2	D	135	ASN

### 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 9 ligands modelled in this entry, 9 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 [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	217/217 (100%)	0.41	19 (8%) 10 10	27, 54, 82, 100	0
1	C	217/217 (100%)	0.81	28 (12%) 3 3	32, 65, 88, 110	0
2	B	217/217 (100%)	0.36	16 (7%) 14 15	23, 40, 85, 108	0
2	D	217/217 (100%)	0.35	14 (6%) 18 19	23, 43, 84, 109	0
All	All	868/868 (100%)	0.48	77 (8%) 9 9	23, 50, 86, 110	0

All (77) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	129	ALA	13.5
2	D	130	ALA	11.6
2	D	129	ALA	10.8
2	B	130	ALA	10.8
2	B	97	TYR	9.9
2	B	128	SER	9.0
2	D	97	TYR	8.9
2	D	128	SER	8.8
2	D	134	THR	7.9
1	A	202	THR	6.6
2	B	133	GLN	6.3
2	D	133	GLN	6.2
1	C	200	THR	6.2
1	C	201	SER	6.0
2	B	135	ASN	5.2
2	B	127	GLY	4.7
2	D	98	GLY	4.6
2	B	64	LYS	4.4
2	D	64	LYS	4.4
2	B	100	PRO	4.4
1	A	169	LYS	4.2

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	203	SER	4.2
2	D	135	ASN	4.2
1	C	56	SER	3.8
1	C	198	HIS	3.8
1	A	27(F)	ARG	3.7
1	A	56	SER	3.6
2	D	127	GLY	3.6
1	A	3	GLN	3.5
1	C	29	ARG	3.5
1	C	212	ASN	3.4
1	A	76	SER	3.3
1	C	26	SER	3.3
1	C	199	LYS	3.3
1	C	41	GLY	3.2
1	C	3	GLN	3.2
1	A	156	GLN	3.0
1	A	157	ASN	3.0
1	C	106	LEU	2.9
1	A	153	SER	2.9
2	B	134	THR	2.9
1	C	145	ASN	2.8
2	B	42	GLY	2.8
1	C	169	LYS	2.8
2	D	100(A)	GLY	2.7
1	A	26	SER	2.7
1	C	49	TYR	2.7
1	A	201	SER	2.6
1	A	77	SER	2.6
1	A	29	ARG	2.5
2	B	98	GLY	2.5
1	C	80	ALA	2.5
1	C	197	THR	2.5
1	C	184	ASP	2.4
1	C	27(A)	SER	2.4
2	B	1	GLU	2.4
1	C	202	THR	2.4
1	A	203	SER	2.4
1	C	86	TYR	2.4
2	D	180	SER	2.4
1	A	27	GLN	2.3
2	D	15	SER	2.3
1	A	28	THR	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	24	ARG	2.3
2	B	195	SER	2.2
1	C	18	LYS	2.2
2	B	93	ALA	2.2
1	A	50	TRP	2.2
1	C	60	ASP	2.2
1	C	134	CYS	2.2
1	A	57	GLY	2.2
2	D	100	PRO	2.2
1	C	156	GLN	2.1
1	C	157	ASN	2.1
1	C	204	PRO	2.1
2	B	183	ASP	2.1
1	A	212	ASN	2.1

## 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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	ZN	C	302	1/1	0.80	0.36	69,69,69,69	1
3	ZN	A	305	1/1	0.84	0.10	64,64,64,64	1
3	ZN	B	309	1/1	0.88	0.08	54,54,54,54	1
3	ZN	C	301	1/1	0.90	0.07	61,61,61,61	1
3	ZN	D	307	1/1	0.92	0.15	65,65,65,65	1
3	ZN	A	304	1/1	0.95	0.16	58,58,58,58	1
3	ZN	C	306	1/1	0.97	0.53	66,66,66,66	1
3	ZN	B	303	1/1	0.97	0.10	61,61,61,61	1
3	ZN	B	308	1/1	0.98	0.07	50,50,50,50	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.