



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 18, 2023 – 10:30 PM EDT

PDB ID : 2DXC  
Title : Recombinant thiocyanate hydrolase, fully-matured form  
Authors : Arakawa, T.; Kawano, Y.; Katayama, Y.; Yohda, M.; Odaka, M.  
Deposited on : 2006-08-25  
Resolution : 1.90 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)  
Xtriage (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

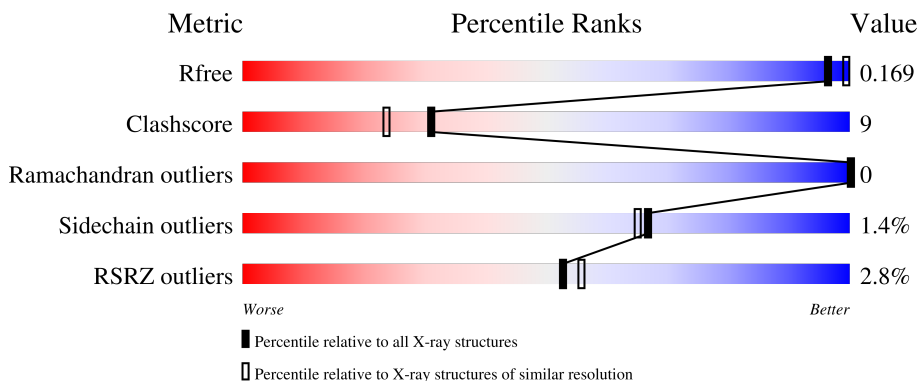
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.90 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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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	126	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 83%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">4%      83%      11%      • 6%</p>
1	D	126	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 82%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">3%      82%      13%      6%</p>
1	G	126	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 84%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">3%      84%      11%      5%</p>
1	J	126	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 84%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">%      84%      10%      • 5%</p>
2	B	157	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 82%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">%      82%      13%      • •</p>

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Mol	Chain	Length	Quality of chain
2	E	157	
2	H	157	
2	K	157	
3	C	243	
3	F	243	
3	I	243	
3	L	243	

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
5	TLA	E	3002	-	-	X	X
5	TLA	I	3003	-	-	X	X

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 18283 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 Thiocyanate hydrolase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	119	Total 965	C 614	N 160	O 187	S 4	0	0	0
1	D	119	Total 965	C 614	N 160	O 187	S 4	0	0	0
1	G	120	Total 974	C 620	N 162	O 188	S 4	0	0	0
1	J	120	Total 974	C 620	N 162	O 188	S 4	0	0	0

- Molecule 2 is a protein called Thiocyanate hydrolase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	152	Total 1232	C 778	N 222	O 226	S 6	0	0	0
2	E	151	Total 1226	C 775	N 221	O 224	S 6	0	0	0
2	H	156	Total 1262	C 796	N 228	O 232	S 6	0	0	0
2	K	152	Total 1232	C 778	N 222	O 226	S 6	0	0	0

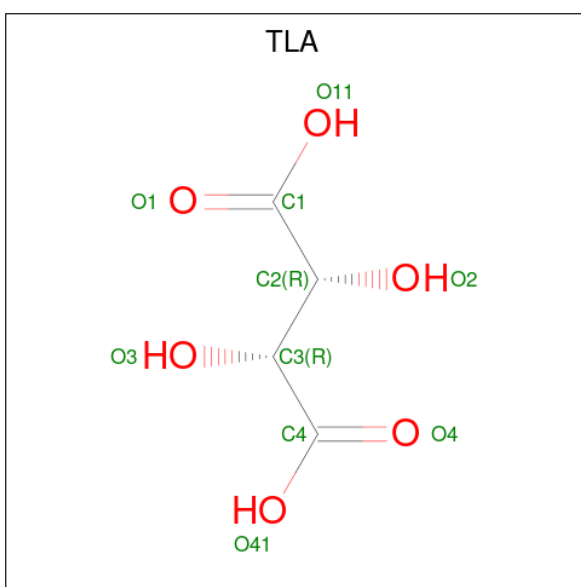
- Molecule 3 is a protein called Thiocyanate hydrolase subunit gamma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	217	Total 1724	C 1098	N 304	O 314	S 8	0	0	0
3	F	216	Total 1715	C 1093	N 303	O 311	S 8	0	0	0
3	I	217	Total 1724	C 1098	N 304	O 314	S 8	0	0	0
3	L	216	Total 1715	C 1093	N 303	O 311	S 8	0	0	0

- Molecule 4 is COBALT (III) ION (three-letter code: 3CO) (formula: Co).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total Co 1 1	0	0
4	F	1	Total Co 1 1	0	0
4	I	1	Total Co 1 1	0	0
4	L	1	Total Co 1 1	0	0

- Molecule 5 is L(+)-TARTARIC ACID (three-letter code: TLA) (formula: C<sub>4</sub>H<sub>6</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C O 10 4 6	0	0
5	E	1	Total C O 10 4 6	0	0
5	I	1	Total C O 10 4 6	0	0
5	L	1	Total C O 10 4 6	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	141	Total O 141 141	0	0

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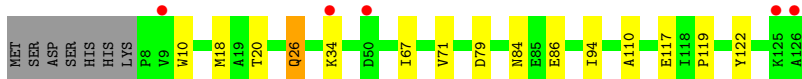
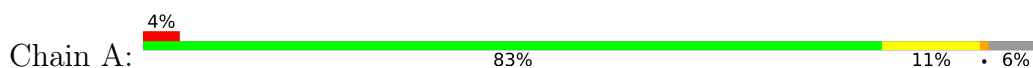
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
6	B	205	Total 205	O 205	0	0
6	C	300	Total 300	O 300	0	0
6	D	156	Total 156	O 156	0	0
6	E	190	Total 190	O 190	0	0
6	F	248	Total 248	O 248	0	0
6	G	150	Total 150	O 150	0	0
6	H	200	Total 200	O 200	0	0
6	I	302	Total 302	O 302	0	0
6	J	168	Total 168	O 168	0	0
6	K	196	Total 196	O 196	0	0
6	L	275	Total 275	O 275	0	0

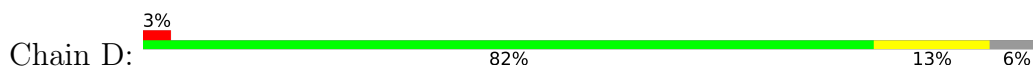
### 3 Residue-property plots [i](#)

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.

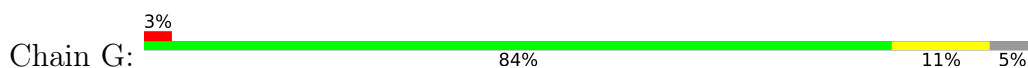
- Molecule 1: Thiocyanate hydrolase subunit alpha



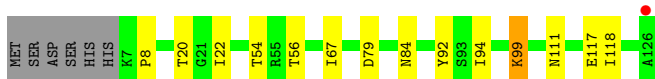
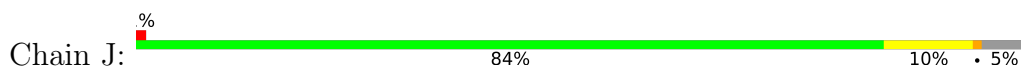
- Molecule 1: Thiocyanate hydrolase subunit alpha



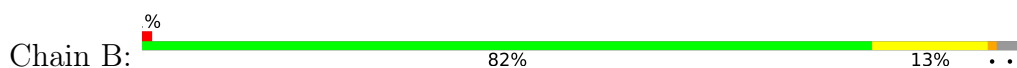
- Molecule 1: Thiocyanate hydrolase subunit alpha



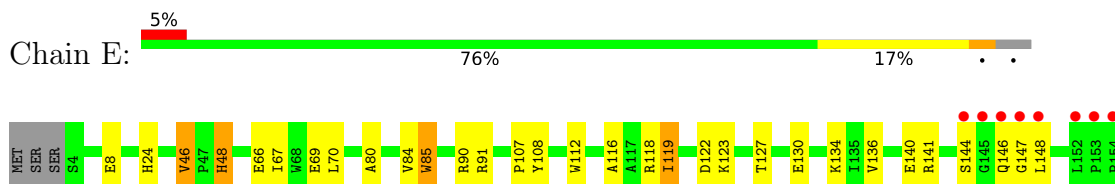
- Molecule 1: Thiocyanate hydrolase subunit alpha



- Molecule 2: Thiocyanate hydrolase subunit beta

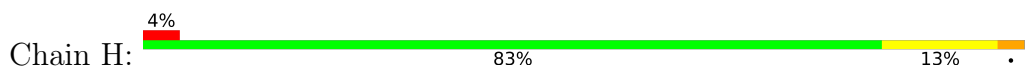


- Molecule 2: Thiocyanate hydrolase subunit beta

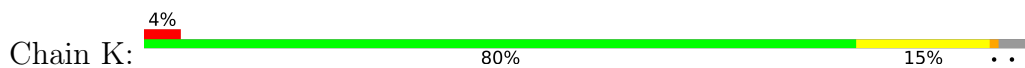


LYS  
ALA  
LYS

- Molecule 2: Thiocyanate hydrolase subunit beta

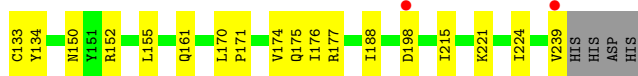
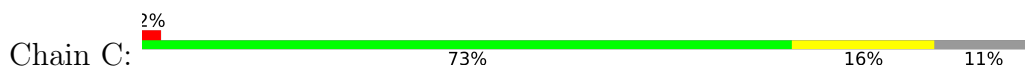


- Molecule 2: Thiocyanate hydrolase subunit beta

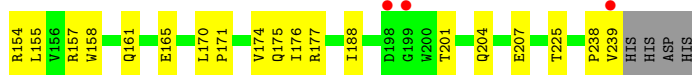


LYS

- Molecule 3: Thiocyanate hydrolase subunit gamma



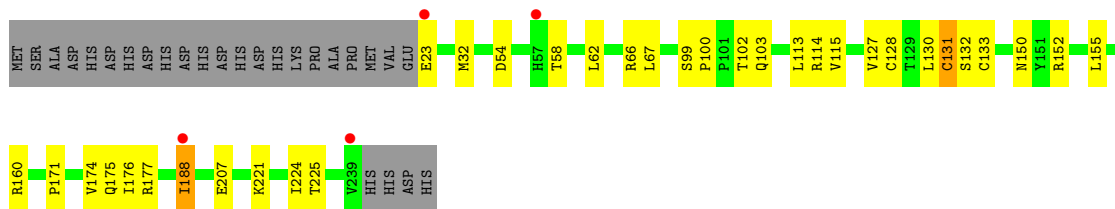
- Molecule 3: Thiocyanate hydrolase subunit gamma



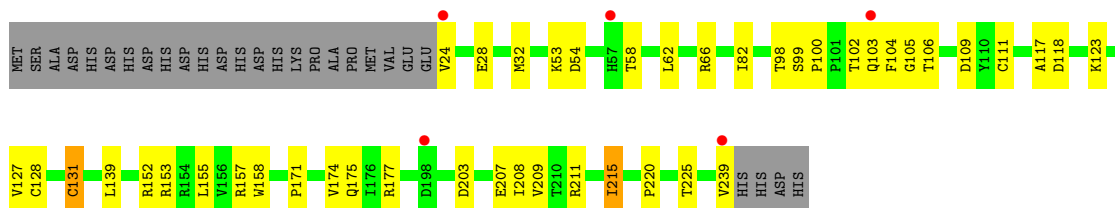
- Molecule 3: Thiocyanate hydrolase subunit gamma







• Molecule 3: Thiocyanate hydrolase subunit gamma



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	114.87Å 170.53Å 175.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.85 – 1.90 41.85 – 1.90	Depositor EDS
% Data completeness (in resolution range)	96.8 (41.85-1.90) 97.6 (41.85-1.90)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.04	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	9.18 (at 1.89Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.171 , 0.193 0.170 , 0.169	Depositor DCC
$R_{free}$ test set	13233 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	14.8	Xtrriage
Anisotropy	0.481	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 54.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.013 for -h,l,k	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	18283	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	16.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.20% 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: CSD, 3CO, CSO, TLA

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	0.33	0/991	0.62	0/1342
1	D	0.33	0/991	0.62	0/1342
1	G	0.33	0/1000	0.59	0/1354
1	J	0.34	0/1000	0.61	0/1354
2	B	0.32	0/1264	0.60	0/1720
2	E	0.30	0/1258	0.58	0/1712
2	H	0.30	0/1294	0.58	0/1757
2	K	0.31	0/1264	0.57	0/1720
3	C	0.29	0/1752	0.60	0/2391
3	F	0.29	0/1743	0.59	0/2379
3	I	0.29	0/1752	0.59	0/2391
3	L	0.29	0/1743	0.61	0/2379
All	All	0.31	0/16052	0.60	0/21841

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	965	0	914	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	965	0	914	17	0
1	G	974	0	926	14	0
1	J	974	0	926	15	0
2	B	1232	0	1198	26	0
2	E	1226	0	1193	33	0
2	H	1262	0	1234	31	0
2	K	1232	0	1198	24	0
3	C	1724	0	1735	31	0
3	F	1715	0	1729	45	0
3	I	1724	0	1735	37	0
3	L	1715	0	1729	39	0
4	C	1	0	0	0	0
4	F	1	0	0	0	0
4	I	1	0	0	0	0
4	L	1	0	0	0	0
5	C	10	0	4	3	0
5	E	10	0	4	5	0
5	I	10	0	4	5	0
5	L	10	0	4	3	0
6	A	141	0	0	3	0
6	B	205	0	0	3	0
6	C	300	0	0	3	0
6	D	156	0	0	1	0
6	E	190	0	0	1	0
6	F	248	0	0	3	0
6	G	150	0	0	0	0
6	H	200	0	0	0	0
6	I	302	0	0	2	0
6	J	168	0	0	0	0
6	K	196	0	0	2	0
6	L	275	0	0	0	0
All	All	18283	0	15447	284	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 9.

All (284) 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)
3:I:113:LEU:HD11	3:I:188:ILE:HD12	1.26	1.13
3:I:115:VAL:HG22	3:I:188:ILE:HD11	1.41	1.03

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:26:GLN:H	1:A:26:GLN:HE21	1.03	0.95
2:K:112:TRP:HZ2	5:L:3004:TLA:HB	0.94	0.91
1:D:45:ILE:HD12	1:D:63:ALA:O	1.72	0.90
3:L:211:ARG:O	3:L:215:ILE:HD13	1.71	0.90
2:E:70:LEU:HD22	3:F:53:LYS:HE3	1.55	0.87
3:L:208:ILE:HD13	3:L:220:PRO:HB2	1.59	0.85
1:D:45:ILE:HD11	1:D:96:PHE:CE1	2.12	0.84
2:H:58:ILE:HD11	2:H:60:TYR:CE1	2.13	0.84
1:J:67:ILE:HD13	1:J:94:ILE:HG13	1.60	0.83
3:F:170:LEU:HD13	3:F:176:ILE:HD11	1.60	0.83
2:K:134:LYS:HD2	2:K:138:MET:HE2	1.62	0.82
2:E:67:ILE:HD11	3:F:239:VAL:HB	1.62	0.82
3:L:82:ILE:HD11	3:L:117:ALA:HB2	1.61	0.81
2:K:119:ILE:HD13	2:K:119:ILE:O	1.80	0.81
2:B:58:ILE:HD13	2:B:58:ILE:H	1.45	0.80
2:E:119:ILE:HD13	2:E:119:ILE:O	1.81	0.79
2:B:58:ILE:HD11	2:B:60:TYR:CE1	2.17	0.79
2:K:119:ILE:HD11	2:K:123:LYS:HD2	1.62	0.78
1:D:45:ILE:HD11	1:D:96:PHE:CZ	2.19	0.78
3:L:175:GLN:HE22	3:L:177:ARG:HH21	1.32	0.77
1:A:26:GLN:H	1:A:26:GLN:NE2	1.80	0.77
2:B:28:HIS:HD2	3:L:153:ARG:HH12	1.32	0.76
1:A:26:GLN:HE21	1:A:26:GLN:N	1.82	0.75
2:E:119:ILE:HD11	2:E:123:LYS:HD2	1.69	0.74
1:A:67:ILE:HG12	1:A:94:ILE:HD11	1.69	0.73
3:L:66:ARG:HH22	3:L:203:ASP:HA	1.54	0.73
2:E:67:ILE:HD11	3:F:239:VAL:CB	2.18	0.73
1:J:56:THR:HG23	1:J:118:ILE:HD12	1.72	0.72
1:A:67:ILE:HG12	1:A:94:ILE:CD1	2.19	0.72
3:I:175:GLN:HE22	3:I:177:ARG:HH21	1.36	0.72
3:F:175:GLN:HE22	3:F:177:ARG:HH11	1.35	0.71
2:E:24:HIS:ND1	2:K:24:HIS:HD2	1.87	0.71
2:K:134:LYS:HD2	2:K:138:MET:CE	2.21	0.70
5:E:3002:TLA:HA	3:F:131:CSD:HD2	1.39	0.70
3:L:82:ILE:CD1	3:L:117:ALA:HB2	2.21	0.70
2:H:148:LEU:HG	3:I:32:MET:HE2	1.73	0.70
1:A:67:ILE:HA	1:A:94:ILE:HD13	1.73	0.69
2:E:148:LEU:CD1	3:F:32:MET:HG3	2.23	0.69
3:F:102:THR:O	3:F:103:GLN:HB2	1.92	0.69
3:L:208:ILE:HD13	3:L:220:PRO:CB	2.23	0.68
3:I:188:ILE:H	3:I:188:ILE:HD13	1.61	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:28:HIS:CD2	3:L:153:ARG:HH12	2.13	0.65
2:B:66:GLU:HB2	2:B:69:GLU:HG3	1.78	0.65
2:K:66:GLU:HB2	2:K:69:GLU:HG3	1.79	0.65
3:C:221:LYS:HB2	3:C:224:ILE:HD13	1.77	0.65
1:G:45:ILE:HD11	1:G:118:ILE:HD13	1.79	0.65
3:I:62:LEU:HD23	6:I:3026:HOH:O	1.96	0.65
2:H:58:ILE:HD13	2:H:58:ILE:H	1.61	0.65
1:G:45:ILE:CD1	1:G:118:ILE:HD13	2.28	0.64
1:D:56:THR:HG23	1:D:118:ILE:HD12	1.80	0.64
2:H:35:ILE:HD12	2:H:35:ILE:N	2.12	0.64
2:E:66:GLU:HB2	2:E:69:GLU:HG3	1.78	0.64
2:H:66:GLU:HB2	2:H:69:GLU:HG3	1.78	0.64
3:I:115:VAL:CG2	3:I:188:ILE:HD11	2.23	0.64
1:J:67:ILE:HD12	1:J:92:TYR:HB3	1.79	0.64
2:K:5:ILE:HD12	2:K:5:ILE:H	1.61	0.63
1:J:20:THR:O	1:J:22:ILE:HD12	1.98	0.63
1:G:13:THR:HB	1:G:17:LYS:HE3	1.80	0.63
3:L:66:ARG:NH2	3:L:203:ASP:HA	2.14	0.63
1:A:86:GLU:CD	1:A:86:GLU:H	2.02	0.63
3:F:115:VAL:HG13	3:F:188:ILE:HD11	1.81	0.63
3:F:142:SER:OG	3:F:147:ARG:HD3	1.98	0.63
3:F:170:LEU:CD1	3:F:176:ILE:HD11	2.29	0.63
1:D:45:ILE:HD13	1:D:60:THR:O	1.99	0.62
2:K:46:VAL:HG12	2:K:96:CYS:SG	2.39	0.62
2:E:148:LEU:HD11	3:F:32:MET:HG3	1.82	0.62
2:H:112:TRP:HZ2	5:I:3003:TLA:O3	1.82	0.62
3:C:134:TYR:CE1	3:C:215:ILE:HD11	2.34	0.62
2:K:84:VAL:CG1	2:K:119:ILE:HD12	2.30	0.61
3:I:221:LYS:HB2	3:I:224:ILE:HD12	1.82	0.61
2:E:84:VAL:CG1	2:E:119:ILE:HD12	2.31	0.61
3:I:188:ILE:HD13	3:I:188:ILE:N	2.16	0.61
3:F:170:LEU:HD13	3:F:176:ILE:CD1	2.29	0.60
2:H:46:VAL:HG12	2:H:96:CYS:SG	2.41	0.60
6:B:302:HOH:O	3:C:29:ILE:HD11	2.02	0.59
1:D:45:ILE:HD11	1:D:96:PHE:HE1	1.67	0.59
3:C:175:GLN:HE22	3:C:177:ARG:HH11	1.49	0.59
2:K:3:SER:O	2:K:7:GLU:HG3	2.03	0.59
2:E:70:LEU:HD21	6:F:531:HOH:O	2.02	0.58
3:I:127:VAL:HG22	3:I:128:CYS:N	2.19	0.58
2:E:134:LYS:HG2	3:F:37:LEU:HD13	1.86	0.58
2:E:112:TRP:CZ2	5:E:3002:TLA:H3	2.39	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:112:TRP:CZ2	5:I:3003:TLA:O3	2.57	0.57
2:E:90:ARG:NH1	5:E:3002:TLA:O4	2.38	0.57
3:F:238:PRO:O	3:F:239:VAL:HB	2.04	0.57
2:H:90:ARG:HH12	5:I:3003:TLA:H3	1.70	0.57
2:H:58:ILE:HD12	3:I:150:ASN:CG	2.25	0.56
1:D:43:VAL:CG1	1:D:67:ILE:HD11	2.35	0.56
2:B:71:ASN:HD21	3:C:53:LYS:NZ	2.02	0.56
3:L:139:LEU:HD21	3:L:215:ILE:HD11	1.86	0.56
3:I:102:THR:O	3:I:103:GLN:HB2	2.04	0.56
1:J:54:THR:HG22	2:K:46:VAL:HG21	1.88	0.56
3:L:127:VAL:HG22	3:L:128:CYS:N	2.19	0.56
1:A:26:GLN:HE22	3:C:111:CYS:HB2	1.70	0.56
2:H:32:PRO:HA	2:H:35:ILE:HD13	1.88	0.56
3:L:208:ILE:HD12	3:L:208:ILE:C	2.27	0.56
2:B:126:VAL:HG12	2:B:127:THR:O	2.06	0.55
2:B:58:ILE:H	2:B:58:ILE:CD1	2.18	0.55
3:C:221:LYS:CB	3:C:224:ILE:HD13	2.37	0.55
2:H:148:LEU:HG	3:I:32:MET:CE	2.37	0.55
2:K:5:ILE:HD12	2:K:5:ILE:N	2.21	0.54
3:C:224:ILE:HD12	3:C:224:ILE:N	2.21	0.54
2:B:112:TRP:HZ2	5:C:3001:TLA:O3	1.90	0.54
3:C:102:THR:O	3:C:103:GLN:HB2	2.07	0.54
3:I:131:CSD:HB3	5:I:3003:TLA:O41	2.08	0.54
1:D:53:TYR:HA	2:E:46:VAL:HG11	1.90	0.54
1:G:111:ASN:O	3:I:175:GLN:HG3	2.07	0.54
2:K:148:LEU:HG	3:L:32:MET:HG3	1.89	0.53
2:B:58:ILE:HD12	3:C:150:ASN:CG	2.28	0.53
2:E:144:SER:OG	2:E:146:GLN:HG3	2.07	0.53
1:G:54:THR:HG22	2:H:46:VAL:HG21	1.89	0.53
3:C:127:VAL:HG22	3:C:128:CYS:N	2.23	0.53
3:F:131:CSD:O	3:F:152:ARG:HD3	2.09	0.53
2:E:148:LEU:HD13	3:F:32:MET:HG3	1.91	0.53
1:J:111:ASN:O	3:L:175:GLN:HG3	2.09	0.53
3:L:139:LEU:HD21	3:L:215:ILE:CD1	2.39	0.53
3:F:127:VAL:HG22	3:F:128:CYS:N	2.23	0.52
1:A:10:TRP:CZ3	1:J:8:PRO:HG2	2.44	0.52
3:I:171:PRO:HB2	3:I:174:VAL:HG23	1.92	0.52
3:F:171:PRO:HB2	3:F:174:VAL:HG23	1.90	0.52
2:H:41:ARG:HG2	2:K:12:HIS:CD2	2.45	0.52
3:L:207:GLU:HG2	3:L:225:THR:CG2	2.39	0.52
2:H:112:TRP:HZ2	5:I:3003:TLA:HB	1.52	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:94:ILE:HD12	1:G:118:ILE:HD12	1.92	0.52
2:B:58:ILE:HD13	2:B:58:ILE:N	2.15	0.52
3:I:221:LYS:HD2	3:I:224:ILE:HD12	1.92	0.52
2:E:119:ILE:HD13	2:E:119:ILE:C	2.30	0.52
3:I:23:GLU:O	3:I:23:GLU:HG2	2.10	0.52
3:F:129:THR:O	3:F:152:ARG:HD2	2.09	0.51
3:L:102:THR:O	3:L:103:GLN:HB2	2.08	0.51
2:B:58:ILE:HD11	2:B:60:TYR:CZ	2.45	0.51
2:B:58:ILE:CD1	2:B:58:ILE:N	2.72	0.51
1:D:20:THR:HA	3:F:104:PHE:HB3	1.93	0.51
2:E:141:ARG:HG2	2:E:147:GLY:O	2.11	0.51
2:B:46:VAL:O	2:B:46:VAL:HG23	2.10	0.51
2:K:136:VAL:O	2:K:140:GLU:HG3	2.11	0.51
3:L:131:CSD:O	3:L:152:ARG:HD2	2.09	0.51
3:L:208:ILE:HD12	3:L:209:VAL:N	2.26	0.51
2:H:91:ARG:HD3	3:I:131:CSD:OD2	2.10	0.51
1:D:111:ASN:O	3:F:175:GLN:HG3	2.10	0.51
3:F:207:GLU:HG2	3:F:225:THR:HG22	1.92	0.51
3:C:127:VAL:HB	3:C:155:LEU:HD23	1.91	0.50
3:L:54:ASP:O	3:L:58:THR:HG23	2.11	0.50
2:H:58:ILE:HD13	2:H:58:ILE:N	2.26	0.50
3:C:131:CSD:O	3:C:152:ARG:HD2	2.12	0.50
1:D:43:VAL:CG2	1:D:67:ILE:HD11	2.42	0.49
1:D:117:GLU:O	1:D:118:ILE:HD13	2.12	0.49
3:F:62:LEU:HB3	3:F:63:PRO:HD3	1.94	0.49
3:F:103:GLN:HG3	6:F:319:HOH:O	2.11	0.49
3:F:115:VAL:HG13	3:F:188:ILE:CD1	2.41	0.49
3:I:62:LEU:H	3:I:62:LEU:HD22	1.76	0.49
6:B:357:HOH:O	3:C:29:ILE:HD12	2.12	0.49
3:C:123:LYS:HG3	3:C:170:LEU:HD21	1.93	0.49
1:A:119:PRO:HG2	1:A:122:TYR:HD2	1.78	0.48
2:B:126:VAL:HG13	2:B:130:GLU:HB2	1.95	0.48
2:E:90:ARG:HH22	5:E:3002:TLA:H2	1.78	0.48
2:E:107:PRO:HG3	2:H:35:ILE:HD11	1.95	0.48
3:I:131:CSD:O	3:I:152:ARG:HD2	2.13	0.48
2:E:107:PRO:HG3	2:H:35:ILE:CD1	2.44	0.48
3:I:62:LEU:HD22	3:I:62:LEU:N	2.29	0.48
3:I:113:LEU:CD1	3:I:188:ILE:HD12	2.19	0.48
1:J:117:GLU:O	1:J:118:ILE:HD13	2.14	0.48
1:D:43:VAL:HG13	1:D:67:ILE:HD11	1.95	0.47
3:F:207:GLU:HG2	3:F:225:THR:CG2	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:91:ARG:HD3	3:F:131:CSD:OD2	2.15	0.47
3:F:67:LEU:C	3:F:67:LEU:HD23	2.34	0.47
3:I:160:ARG:NE	3:I:176:ILE:HD12	2.30	0.47
2:B:42:ALA:O	2:B:45:ARG:HG2	2.15	0.47
3:I:54:ASP:O	3:I:58:THR:HG23	2.14	0.47
1:A:84:ASN:ND2	2:K:124:GLN:HE21	2.12	0.47
2:K:46:VAL:CG1	2:K:96:CYS:SG	3.02	0.47
2:K:119:ILE:HD13	2:K:119:ILE:C	2.35	0.47
6:E:3118:HOH:O	3:F:49:HIS:HD2	1.98	0.47
3:L:207:GLU:HG2	3:L:225:THR:HG22	1.97	0.47
3:I:132:SER:O	3:I:133:CSO:C	2.63	0.46
2:E:118:ARG:HG3	2:E:122:ASP:OD2	2.15	0.46
3:C:132:SER:O	3:C:133:CSO:C	2.63	0.46
1:G:117:GLU:C	1:G:118:ILE:HG13	2.35	0.46
2:K:70:LEU:HG	3:L:53:LYS:HE3	1.97	0.46
2:B:112:TRP:CZ2	5:C:3001:TLA:H3	2.51	0.46
3:C:170:LEU:HD13	3:C:176:ILE:HD11	1.97	0.46
3:L:24:VAL:HG13	3:L:28:GLU:HB2	1.97	0.46
2:B:37:HIS:HE1	2:E:8:GLU:OE2	1.99	0.46
1:G:86:GLU:CD	1:G:86:GLU:H	2.18	0.46
2:H:48:HIS:HB2	3:I:130:LEU:O	2.16	0.46
3:I:99:SER:HB2	3:I:100:PRO:HD3	1.98	0.46
2:B:65:GLU:OE1	2:B:70:LEU:HB2	2.16	0.46
1:D:67:ILE:N	1:D:67:ILE:HD12	2.31	0.46
3:L:62:LEU:O	3:L:66:ARG:HG2	2.15	0.45
1:J:94:ILE:HD12	1:J:94:ILE:N	2.31	0.45
2:H:31:ALA:O	2:H:35:ILE:CD1	2.64	0.45
3:F:154:ARG:NH2	3:F:165:GLU:OE2	2.40	0.45
6:K:341:HOH:O	3:L:239:VAL:HB	2.16	0.45
1:A:79:ASP:HA	6:A:313:HOH:O	2.17	0.45
3:F:201:THR:OG1	3:F:204:GLN:HG3	2.16	0.45
3:I:113:LEU:HD11	3:I:188:ILE:CD1	2.19	0.45
3:I:207:GLU:HG2	3:I:225:THR:CG2	2.46	0.45
2:E:90:ARG:HH12	5:E:3002:TLA:C4	2.30	0.44
1:A:71:VAL:HG11	1:A:117:GLU:OE2	2.17	0.44
3:F:188:ILE:HD12	3:F:188:ILE:C	2.37	0.44
3:L:171:PRO:HB2	3:L:174:VAL:HG23	1.98	0.44
3:L:131:CSD:HB3	5:L:3004:TLA:O41	2.18	0.44
6:D:246:HOH:O	1:G:7:LYS:HB2	2.17	0.43
3:F:127:VAL:HB	3:F:155:LEU:HD23	2.00	0.43
2:H:45:ARG:HH11	2:H:100:GLN:HE22	1.64	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:58:ILE:HD12	3:I:150:ASN:ND2	2.33	0.43
3:L:127:VAL:HB	3:L:155:LEU:HD23	1.99	0.43
3:C:171:PRO:HB2	3:C:174:VAL:HG23	1.99	0.43
1:A:20:THR:HA	3:C:104:PHE:HB3	2.00	0.43
1:A:34:LYS:HD3	6:A:2521:HOH:O	2.17	0.43
3:C:161:GLN:HG2	6:F:426:HOH:O	2.19	0.43
2:H:28:HIS:ND1	2:H:28:HIS:N	2.66	0.43
2:E:116:ALA:O	2:E:119:ILE:HG22	2.18	0.43
1:G:41:ASP:HB2	1:G:67:ILE:HD12	1.99	0.43
1:J:99:LYS:HB2	1:J:99:LYS:NZ	2.34	0.43
3:L:175:GLN:NE2	3:L:177:ARG:HH21	2.09	0.43
1:G:13:THR:CB	1:G:17:LYS:HE3	2.45	0.43
2:H:46:VAL:CG1	2:H:96:CYS:SG	3.07	0.43
3:L:106:THR:OG1	3:L:109:ASP:HB2	2.19	0.43
3:F:126:VAL:HG12	3:F:127:VAL:N	2.33	0.43
2:K:90:ARG:HH12	5:L:3004:TLA:H3	1.83	0.43
3:L:98:THR:HA	3:L:103:GLN:OE1	2.19	0.43
1:A:86:GLU:CD	1:A:86:GLU:N	2.71	0.43
2:B:67:ILE:HG12	3:C:239:VAL:HA	2.01	0.43
1:D:121:ARG:HG3	1:D:122:TYR:CD1	2.54	0.43
1:J:79:ASP:HB3	1:J:84:ASN:O	2.18	0.43
2:K:80:ALA:HA	2:K:85:TRP:O	2.19	0.43
2:B:142:VAL:HG21	3:C:24:VAL:HG21	2.01	0.42
2:E:80:ALA:HA	2:E:85:TRP:O	2.19	0.42
3:F:132:SER:O	3:F:133:CSO:C	2.67	0.42
3:F:171:PRO:HD2	3:F:174:VAL:HG21	2.01	0.42
3:F:238:PRO:O	3:F:239:VAL:CB	2.67	0.42
3:I:175:GLN:NE2	3:I:177:ARG:HH21	2.12	0.42
2:B:112:TRP:CZ2	5:C:3001:TLA:C3	3.03	0.42
3:C:36:GLU:O	3:C:40:GLU:HB2	2.19	0.42
2:B:48:HIS:HB2	3:C:130:LEU:O	2.18	0.42
3:F:157:ARG:HD3	3:F:158:TRP:CH2	2.54	0.42
2:E:127:THR:OG1	2:E:130:GLU:HG3	2.20	0.42
3:I:67:LEU:HD23	3:I:67:LEU:C	2.39	0.42
1:D:114:LEU:C	1:D:114:LEU:HD23	2.40	0.42
2:H:11:ARG:HD3	6:K:320:HOH:O	2.20	0.42
2:H:80:ALA:HA	2:H:85:TRP:O	2.20	0.42
3:I:175:GLN:HE22	3:I:177:ARG:NH2	2.12	0.42
2:B:124:GLN:HE21	1:J:84:ASN:ND2	2.18	0.42
3:L:215:ILE:CD1	3:L:215:ILE:N	2.82	0.42
3:I:114:ARG:O	3:I:188:ILE:HD13	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:106:THR:OG1	3:C:109:ASP:HB2	2.20	0.41
3:F:175:GLN:NE2	3:F:177:ARG:HH11	2.10	0.41
2:H:39:LEU:HD12	2:H:39:LEU:HA	1.92	0.41
2:H:56:VAL:HG12	2:K:55:ASP:C	2.41	0.41
3:L:118:ASP:OD2	3:L:123:LYS:HD2	2.20	0.41
1:G:7:LYS:HB2	1:G:8:PRO:HD3	2.01	0.41
1:J:20:THR:HA	3:L:104:PHE:HB3	2.01	0.41
3:C:113:LEU:HD11	3:C:188:ILE:HG12	2.03	0.41
1:J:67:ILE:HD12	1:J:92:TYR:CB	2.48	0.41
3:C:106:THR:HG1	3:C:109:ASP:HB2	1.85	0.41
2:E:67:ILE:HD11	3:F:239:VAL:CA	2.51	0.41
2:E:136:VAL:O	2:E:140:GLU:HG3	2.20	0.41
2:K:69:GLU:HB3	2:K:109:TYR:CD1	2.56	0.41
2:H:45:ARG:NH1	2:H:100:GLN:HE22	2.19	0.41
3:L:208:ILE:C	3:L:208:ILE:CD1	2.88	0.41
1:A:79:ASP:HB3	1:A:84:ASN:O	2.19	0.41
2:B:137:GLU:HB3	6:B:228:HOH:O	2.21	0.41
6:C:3155:HOH:O	3:F:161:GLN:HG2	2.20	0.41
2:H:116:ALA:O	2:H:119:ILE:HG22	2.21	0.41
3:I:127:VAL:HB	3:I:155:LEU:HD23	2.03	0.41
3:L:99:SER:N	3:L:100:PRO:CD	2.84	0.41
3:L:157:ARG:HD3	3:L:158:TRP:CH2	2.56	0.41
2:B:58:ILE:HD12	3:C:150:ASN:ND2	2.36	0.41
3:C:54:ASP:O	3:C:58:THR:HG23	2.21	0.40
3:C:221:LYS:HE2	6:C:3214:HOH:O	2.21	0.40
1:D:43:VAL:HG22	1:D:67:ILE:HD11	2.03	0.40
2:E:108:TYR:CZ	3:F:147:ARG:HD2	2.56	0.40
1:A:110:ALA:HA	6:A:1016:HOH:O	2.21	0.40
1:G:12:ARG:HD2	6:I:3086:HOH:O	2.20	0.40
3:L:105:GLY:HA3	3:L:111:CYS:SG	2.60	0.40
3:C:66:ARG:HD2	6:C:3116:HOH:O	2.21	0.40
3:F:102:THR:HB	3:F:104:PHE:CE2	2.56	0.40
1:G:7:LYS:N	1:G:8:PRO:CD	2.84	0.40
3:I:160:ARG:CD	3:I:176:ILE:HD12	2.52	0.40
2:E:48:HIS:HB2	3:F:130:LEU:O	2.22	0.40
1:J:92:TYR:O	1:J:94:ILE:HD12	2.21	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	117/126 (93%)	111 (95%)	6 (5%)	0	100	100
1	D	117/126 (93%)	111 (95%)	6 (5%)	0	100	100
1	G	118/126 (94%)	113 (96%)	5 (4%)	0	100	100
1	J	118/126 (94%)	113 (96%)	5 (4%)	0	100	100
2	B	150/157 (96%)	146 (97%)	4 (3%)	0	100	100
2	E	149/157 (95%)	146 (98%)	3 (2%)	0	100	100
2	H	154/157 (98%)	150 (97%)	4 (3%)	0	100	100
2	K	150/157 (96%)	147 (98%)	3 (2%)	0	100	100
3	C	213/243 (88%)	206 (97%)	7 (3%)	0	100	100
3	F	212/243 (87%)	201 (95%)	11 (5%)	0	100	100
3	I	213/243 (88%)	206 (97%)	7 (3%)	0	100	100
3	L	212/243 (87%)	204 (96%)	8 (4%)	0	100	100
All	All	1923/2104 (91%)	1854 (96%)	69 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 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	101/108 (94%)	99 (98%)	2 (2%)	55	51
1	D	101/108 (94%)	100 (99%)	1 (1%)	76	76

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	102/108 (94%)	102 (100%)	0	100	100
1	J	102/108 (94%)	101 (99%)	1 (1%)	76	76
2	B	130/134 (97%)	126 (97%)	4 (3%)	40	32
2	E	129/134 (96%)	125 (97%)	4 (3%)	40	32
2	H	133/134 (99%)	129 (97%)	4 (3%)	41	33
2	K	130/134 (97%)	127 (98%)	3 (2%)	50	45
3	C	188/212 (89%)	187 (100%)	1 (0%)	88	89
3	F	187/212 (88%)	187 (100%)	0	100	100
3	I	188/212 (89%)	186 (99%)	2 (1%)	73	73
3	L	187/212 (88%)	186 (100%)	1 (0%)	88	89
All	All	1678/1816 (92%)	1655 (99%)	23 (1%)	67	65

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	MET
1	A	26	GLN
2	B	48	HIS
2	B	58	ILE
2	B	85	TRP
2	B	150	GLU
3	C	198	ASP
1	D	25	PRO
2	E	46	VAL
2	E	48	HIS
2	E	85	TRP
2	E	119	ILE
2	H	39	LEU
2	H	48	HIS
2	H	58	ILE
2	H	85	TRP
3	I	66	ARG
3	I	188	ILE
1	J	99	LYS
2	K	48	HIS
2	K	85	TRP
2	K	119	ILE
3	L	215	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	GLN
1	A	84	ASN
1	A	111	ASN
2	B	28	HIS
2	B	37	HIS
2	B	71	ASN
2	B	100	GLN
2	B	124	GLN
3	C	141	GLN
3	C	175	GLN
1	D	84	ASN
2	E	94	GLN
2	E	100	GLN
2	E	124	GLN
2	E	146	GLN
3	F	49	HIS
3	F	175	GLN
1	G	14	HIS
1	G	87	ASN
2	H	61	HIS
2	H	100	GLN
2	H	146	GLN
3	I	112	ASN
3	I	124	HIS
3	I	141	GLN
3	I	169	GLN
3	I	175	GLN
3	I	236	ASN
2	K	12	HIS
2	K	24	HIS
2	K	100	GLN
2	K	146	GLN
3	L	112	ASN
3	L	175	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

8 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	CSO	C	133	4	3,6,7	0.74	0	0,6,8	-	-
3	CSD	I	131	4	3,7,8	0.81	0	1,8,10	2.12	1 (100%)
3	CSD	C	131	4	3,7,8	0.81	0	1,8,10	2.13	1 (100%)
3	CSO	F	133	4	3,6,7	0.71	0	0,6,8	-	-
3	CSD	F	131	4	3,7,8	0.84	0	1,8,10	2.20	1 (100%)
3	CSO	L	133	4	3,6,7	0.68	0	0,6,8	-	-
3	CSD	L	131	4	3,7,8	0.82	0	1,8,10	2.14	1 (100%)
3	CSO	I	133	4	3,6,7	0.71	0	0,6,8	-	-

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	CSO	C	133	4	-	0/1/5/7	-
3	CSD	I	131	4	-	0/2/6/8	-
3	CSD	C	131	4	-	0/2/6/8	-
3	CSO	F	133	4	-	0/1/5/7	-
3	CSD	F	131	4	-	0/2/6/8	-
3	CSO	L	133	4	-	0/1/5/7	-
3	CSD	L	131	4	-	0/2/6/8	-
3	CSO	I	133	4	-	0/1/5/7	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	131	CSD	OD1-SG-CB	2.20	109.71	105.54
3	L	131	CSD	OD1-SG-CB	2.14	109.61	105.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	131	CSD	OD1-SG-CB	2.13	109.58	105.54
3	I	131	CSD	OD1-SG-CB	2.12	109.58	105.54

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

7 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	133	CSO	1	0
3	I	131	CSD	3	0
3	C	131	CSD	1	0
3	F	133	CSO	1	0
3	F	131	CSD	3	0
3	L	131	CSD	2	0
3	I	133	CSO	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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
5	TLA	L	3004	-	9,9,9	2.03	4 (44%)	12,12,12	0.90	0
5	TLA	E	3002	-	9,9,9	1.93	3 (33%)	12,12,12	0.91	0
5	TLA	C	3001	-	9,9,9	2.00	5 (55%)	12,12,12	0.89	0
5	TLA	I	3003	-	9,9,9	2.12	5 (55%)	12,12,12	1.00	1 (8%)



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
5	TLA	L	3004	-	-	4/12/12/12	-
5	TLA	E	3002	-	-	4/12/12/12	-
5	TLA	C	3001	-	-	4/12/12/12	-
5	TLA	I	3003	-	-	4/12/12/12	-

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	I	3003	TLA	O2-C2	3.53	1.49	1.42
5	L	3004	TLA	O2-C2	3.35	1.49	1.42
5	C	3001	TLA	O2-C2	3.13	1.48	1.42
5	E	3002	TLA	O1-C1	2.95	1.31	1.22
5	I	3003	TLA	O1-C1	2.75	1.30	1.22
5	L	3004	TLA	O1-C1	2.74	1.30	1.22
5	C	3001	TLA	O1-C1	2.63	1.30	1.22
5	C	3001	TLA	O11-C1	-2.53	1.22	1.30
5	E	3002	TLA	O2-C2	2.53	1.47	1.42
5	E	3002	TLA	O11-C1	-2.36	1.22	1.30
5	L	3004	TLA	O11-C1	-2.19	1.23	1.30
5	I	3003	TLA	O11-C1	-2.17	1.23	1.30
5	I	3003	TLA	C2-C1	2.13	1.55	1.52
5	I	3003	TLA	O4-C4	2.13	1.28	1.22
5	C	3001	TLA	O4-C4	2.11	1.28	1.22
5	L	3004	TLA	O4-C4	2.07	1.28	1.22
5	C	3001	TLA	C2-C1	2.01	1.55	1.52

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	I	3003	TLA	O41-C4-C3	2.25	119.34	113.27

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	3001	TLA	O11-C1-C2-C3
5	E	3002	TLA	O11-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
5	L	3004	TLA	O11-C1-C2-C3
5	C	3001	TLA	O1-C1-C2-C3
5	L	3004	TLA	O1-C1-C2-C3
5	E	3002	TLA	O1-C1-C2-C3
5	I	3003	TLA	O11-C1-C2-C3
5	C	3001	TLA	O1-C1-C2-O2
5	C	3001	TLA	O11-C1-C2-O2
5	E	3002	TLA	O11-C1-C2-O2
5	L	3004	TLA	O11-C1-C2-O2
5	I	3003	TLA	O1-C1-C2-C3
5	L	3004	TLA	O1-C1-C2-O2
5	I	3003	TLA	O11-C1-C2-O2
5	E	3002	TLA	O1-C1-C2-O2
5	I	3003	TLA	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	L	3004	TLA	3	0
5	E	3002	TLA	5	0
5	C	3001	TLA	3	0
5	I	3003	TLA	5	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	119/126 (94%)	-0.09	5 (4%) 36 39	9, 15, 30, 36	0
1	D	119/126 (94%)	-0.20	4 (3%) 45 48	9, 13, 29, 31	0
1	G	120/126 (95%)	-0.13	4 (3%) 46 49	9, 15, 29, 41	0
1	J	120/126 (95%)	-0.32	1 (0%) 86 87	9, 12, 27, 42	0
2	B	152/157 (96%)	-0.30	2 (1%) 77 79	8, 12, 26, 31	0
2	E	151/157 (96%)	-0.15	8 (5%) 26 29	8, 13, 31, 40	0
2	H	156/157 (99%)	-0.17	6 (3%) 40 43	8, 12, 26, 56	0
2	K	152/157 (96%)	-0.15	7 (4%) 32 35	8, 12, 28, 39	0
3	C	215/243 (88%)	-0.21	4 (1%) 66 69	8, 13, 25, 44	0
3	F	214/243 (88%)	-0.02	5 (2%) 60 63	9, 16, 30, 39	0
3	I	215/243 (88%)	-0.23	4 (1%) 66 69	8, 13, 23, 42	0
3	L	214/243 (88%)	-0.20	5 (2%) 60 63	8, 13, 26, 40	0
All	All	1947/2104 (92%)	-0.18	55 (2%) 53 56	8, 13, 27, 56	0

All (55) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	157	LYS	7.8
3	C	239	VAL	7.2
3	L	239	VAL	6.7
2	H	156	ALA	5.8
3	I	239	VAL	5.7
3	F	239	VAL	5.5
2	K	3	SER	4.7
2	H	2	SER	4.5
1	G	126	ALA	4.0
3	I	23	GLU	3.9
2	H	3	SER	3.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
3	C	23	GLU	3.7
2	B	150	GLU	3.6
2	H	28	HIS	3.5
2	K	144	SER	3.5
2	K	146	GLN	3.5
2	K	153	PRO	3.4
2	H	155	LYS	3.4
1	A	126	ALA	3.4
2	E	152	LEU	3.3
2	K	152	LEU	3.2
1	A	125	LYS	3.2
2	E	153	PRO	3.2
3	F	198	ASP	3.1
2	E	146	GLN	3.0
1	D	126	ALA	3.0
2	K	145	GLY	2.9
2	K	154	PRO	2.9
3	F	199	GLY	2.8
2	E	147	GLY	2.8
2	E	145	GLY	2.8
3	F	103	GLN	2.7
2	E	154	PRO	2.7
3	L	103	GLN	2.5
3	C	198	ASP	2.5
3	L	24	VAL	2.5
3	I	57	HIS	2.5
1	A	50	ASP	2.5
1	G	34	LYS	2.4
1	A	34	LYS	2.3
3	L	57	HIS	2.3
1	D	50	ASP	2.3
3	L	198	ASP	2.2
1	J	126	ALA	2.2
1	G	110	ALA	2.2
1	D	125	LYS	2.2
2	E	148	LEU	2.1
3	I	188	ILE	2.1
2	E	144	SER	2.1
3	F	141	GLN	2.1
1	D	34	LYS	2.1
2	B	154	PRO	2.1
3	C	76	GLU	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	9	VAL	2.0
1	G	7	LYS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [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	CSO	C	133	7/8	0.97	0.10	10,11,14,17	1
3	CSD	F	131	8/9	0.97	0.10	11,13,14,15	2
3	CSO	F	133	7/8	0.97	0.10	11,13,16,17	1
3	CSD	L	131	8/9	0.97	0.09	9,11,14,15	2
3	CSD	I	131	8/9	0.98	0.09	10,12,13,14	1
3	CSO	I	133	7/8	0.98	0.12	11,11,13,17	1
3	CSD	C	131	8/9	0.98	0.10	9,11,13,13	2
3	CSO	L	133	7/8	0.98	0.09	9,10,14,14	1

## 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
5	TLA	I	3003	10/10	0.55	0.54	44,46,50,51	0
5	TLA	L	3004	10/10	0.72	0.38	32,36,39,41	0
5	TLA	C	3001	10/10	0.75	0.34	27,31,31,35	0
5	TLA	E	3002	10/10	0.78	0.43	34,41,46,46	0
4	3CO	F	301	1/1	0.98	0.08	14,14,14,14	1
4	3CO	I	301	1/1	0.99	0.03	7,7,7,7	1
4	3CO	L	301	1/1	0.99	0.05	9,9,9,9	1
4	3CO	C	301	1/1	0.99	0.04	6,6,6,6	1

## 6.5 Other polymers [i](#)

There are no such residues in this entry.