



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 09:08 PM EDT

PDB ID : 3R2B  
Title : MK2 kinase bound to Compound 5b  
Authors : Oubrie, A.; van Zeeland, M.; Versteegh, J.  
Deposited on : 2011-03-14  
Resolution : 2.90 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 2.36.2  
buster-report : 1.1.7 (2018)  
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) : 2.36.2

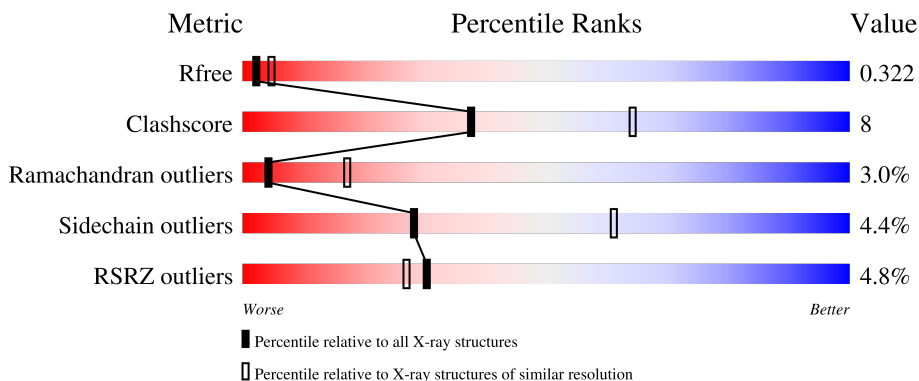
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	318	 2% 67% 16% 14%
1	B	318	 3% 64% 19% 14%
1	C	318	 4% 69% 15% 14%
1	D	318	 3% 69% 14% 14%
1	E	318	 3% 66% 17% 14%

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Mol	Chain	Length	Quality of chain
1	F	318	<p>3% 68% 14% • 14%</p>
1	G	318	<p>3% 68% 15% • 14%</p>
1	H	318	<p>7% 69% 14% • 14%</p>
1	I	318	<p>4% 68% 15% • 14%</p>
1	J	318	<p>4% 69% 14% • 14%</p>
1	K	318	<p>10% 67% 17% • 14%</p>
1	L	318	<p>4% 65% 19% • 14%</p>

## 2 Entry composition [i](#)

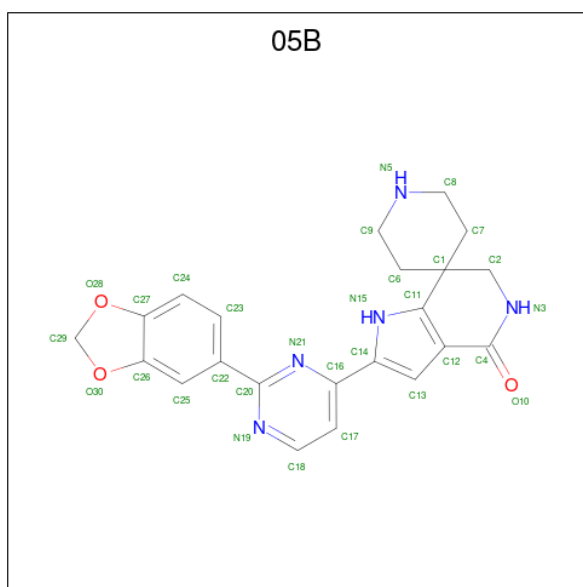
There are 2 unique types of molecules in this entry. The entry contains 26381 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MAP kinase-activated protein kinase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	272	2194	1405	374	398	17	0	0	0
1	B	272	2197	1405	376	399	17	0	0	0
1	C	272	2197	1406	375	399	17	0	0	0
1	D	272	2193	1404	374	398	17	0	0	0
1	E	272	2198	1407	375	399	17	0	0	0
1	F	272	2191	1402	374	398	17	0	0	0
1	G	272	2191	1404	373	397	17	0	0	0
1	H	272	2187	1400	373	397	17	0	0	0
1	I	272	2181	1395	372	397	17	0	0	0
1	J	272	2195	1405	375	398	17	0	0	0
1	K	272	2196	1405	375	399	17	0	0	0
1	L	272	2201	1410	375	399	17	0	0	0

- Molecule 2 is 2'-[2-(1,3-benzodioxol-5-yl)pyrimidin-4-yl]-5',6'-dihydrospiro[piperidine-4,7'-pyrrolo[3,2-c]pyridin]-4'(1'H)-one (three-letter code: 05B) (formula: C<sub>22</sub>H<sub>21</sub>N<sub>5</sub>O<sub>3</sub>).

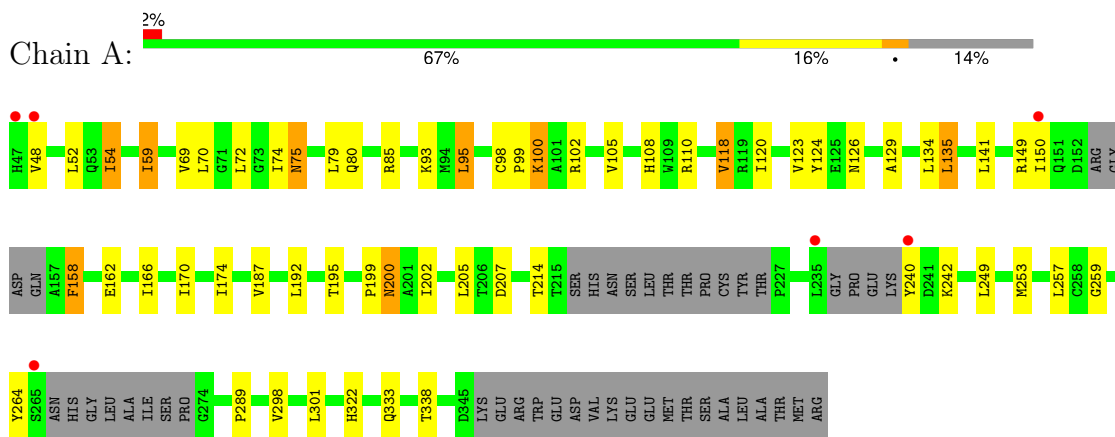


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	30	22	5	3	0	0
2	B	1	30	22	5	3	0	0

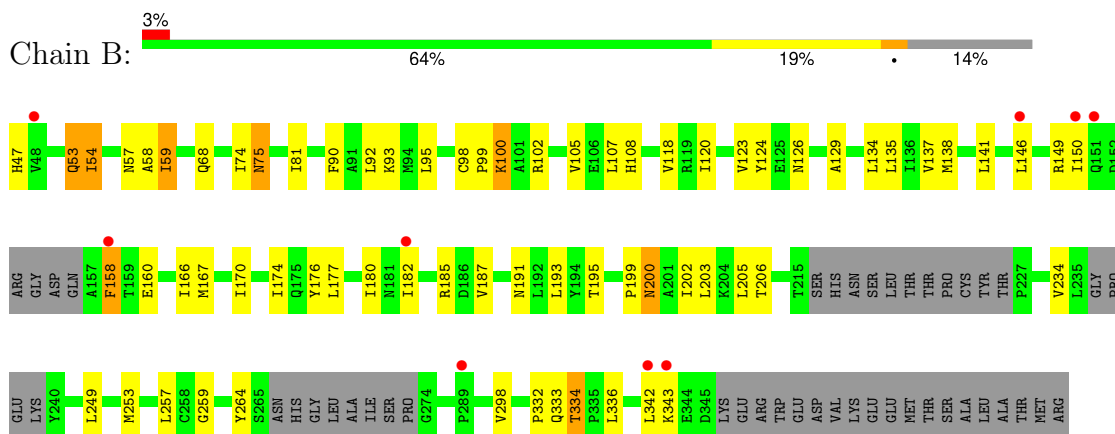
### 3 Residue-property plots [i](#)

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.

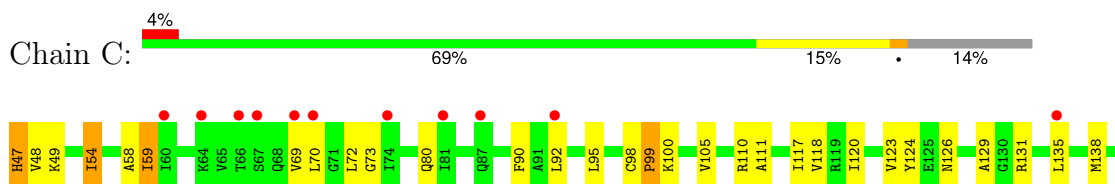
- Molecule 1: MAP kinase-activated protein kinase 2

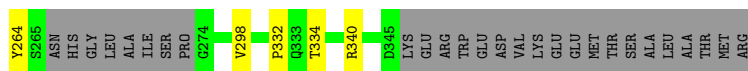
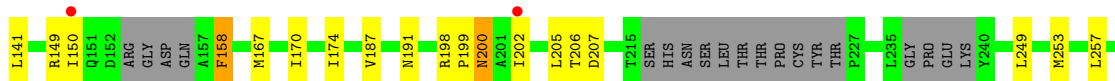


- Molecule 1: MAP kinase-activated protein kinase 2

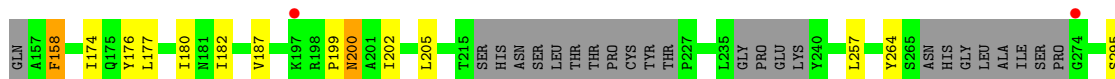


- Molecule 1: MAP kinase-activated protein kinase 2

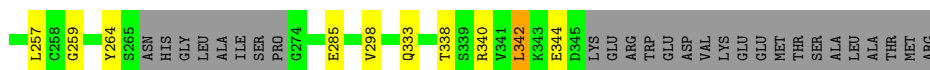
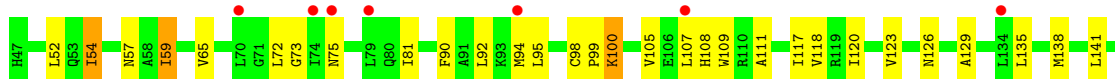




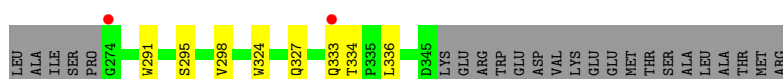
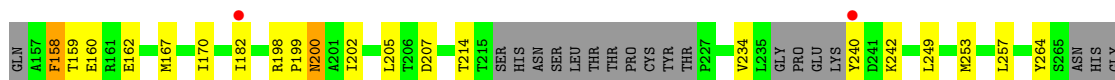
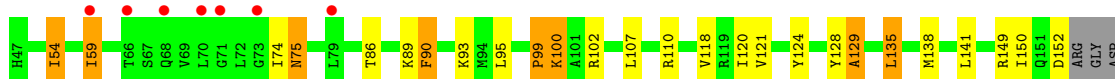
● Molecule 1: MAP kinase-activated protein kinase 2



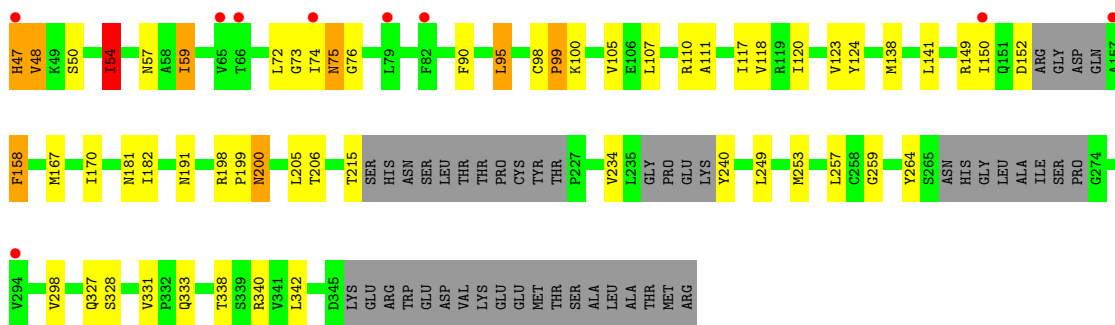
● Molecule 1: MAP kinase-activated protein kinase 2



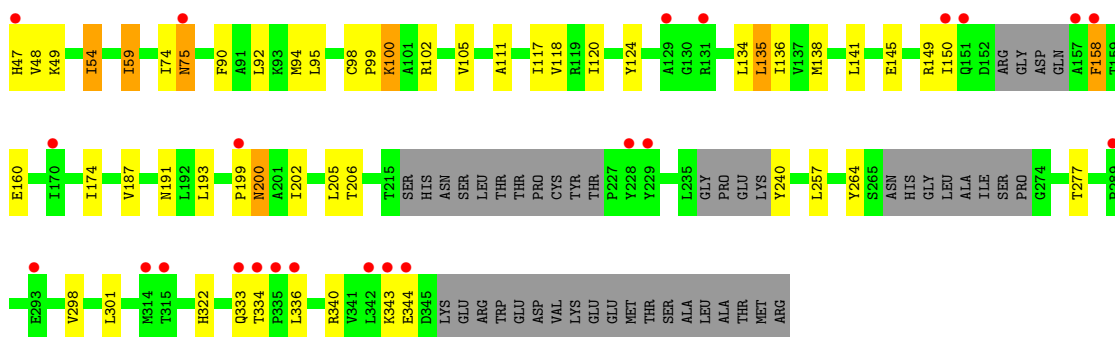
● Molecule 1: MAP kinase-activated protein kinase 2



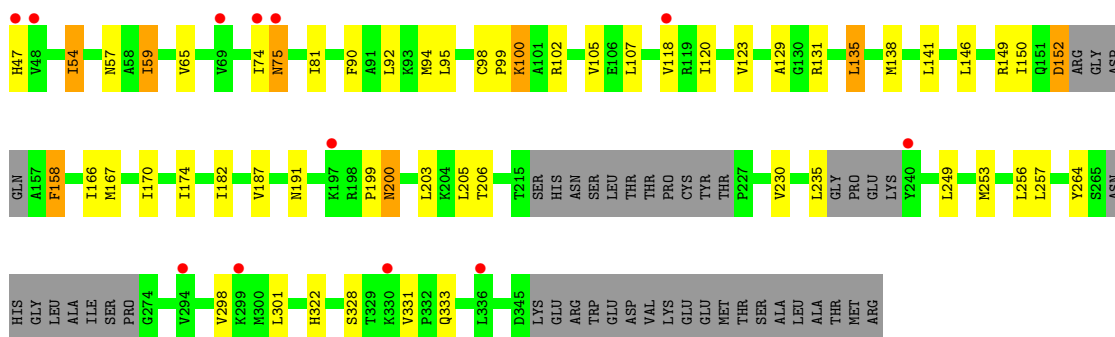
● Molecule 1: MAP kinase-activated protein kinase 2



• Molecule 1: MAP kinase-activated protein kinase 2



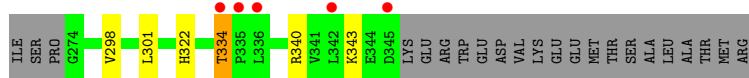
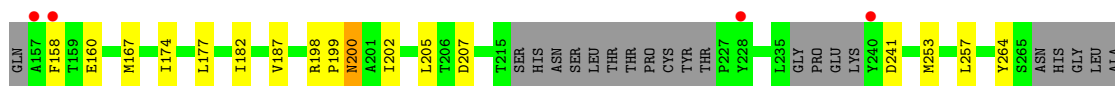
• Molecule 1: MAP kinase-activated protein kinase 2



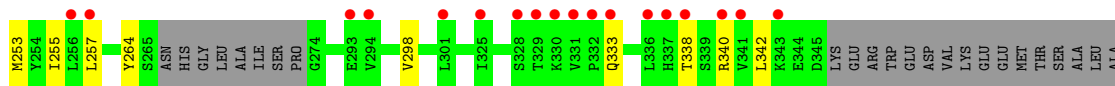
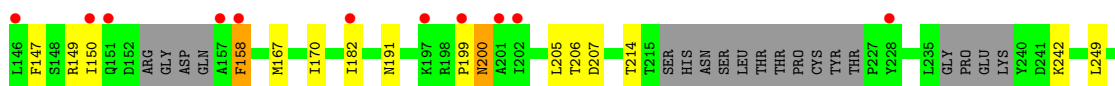
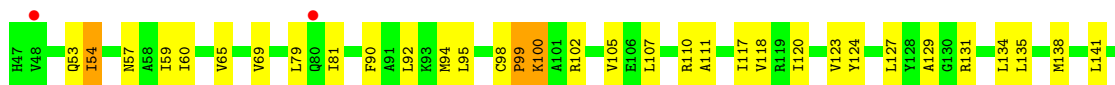
• Molecule 1: MAP kinase-activated protein kinase 2





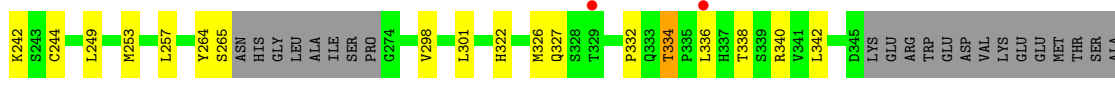
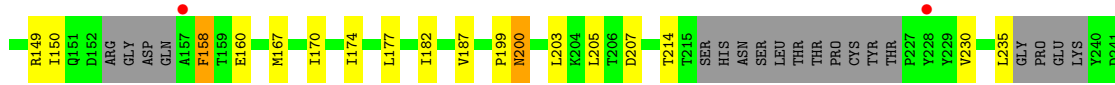
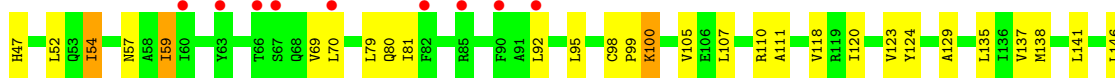


● Molecule 1: MAP kinase-activated protein kinase 2



THR  
MET  
ARG

● Molecule 1: MAP kinase-activated protein kinase 2



LEU  
ALA  
THR  
MET  
ARG

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	139.80Å 180.25Å 217.11Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	51.97 – 2.90 51.97 – 2.90	Depositor EDS
% Data completeness (in resolution range)	61.3 (51.97-2.90) 61.3 (51.97-2.90)	Depositor EDS
$R_{merge}$	0.16	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.70 (at 2.91Å)	Xtrriage
Refinement program	REFMAC 5.4.0078	Depositor
R, $R_{free}$	0.277 , 0.316 0.282 , 0.322	Depositor DCC
$R_{free}$ test set	3743 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	91.0	Xtrriage
Anisotropy	0.067	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 59.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	26381	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	100.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.98% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 05B

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	0/2239	0.51	0/3020
1	B	0.31	0/2242	0.50	0/3022
1	C	0.33	0/2242	0.49	0/3024
1	D	0.33	0/2238	0.50	0/3018
1	E	0.31	0/2243	0.50	0/3025
1	F	0.33	0/2236	0.51	0/3016
1	G	0.31	0/2236	0.48	0/3016
1	H	0.30	0/2232	0.48	0/3011
1	I	0.31	0/2226	0.48	0/3004
1	J	0.31	0/2240	0.51	0/3020
1	K	0.30	0/2241	0.48	0/3022
1	L	0.31	0/2246	0.49	0/3029
All	All	0.31	0/26861	0.49	0/36227

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

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	2194	0	2203	45	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	2197	0	2204	45	0
1	C	2197	0	2207	35	0
1	D	2193	0	2198	32	0
1	E	2198	0	2209	33	0
1	F	2191	0	2194	32	0
1	G	2191	0	2199	38	0
1	H	2187	0	2188	26	0
1	I	2181	0	2170	31	0
1	J	2195	0	2205	33	0
1	K	2196	0	2202	35	0
1	L	2201	0	2218	39	0
2	A	30	0	21	1	0
2	B	30	0	21	1	0
All	All	26381	0	26439	405	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 8.

All (405) 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:A:118:VAL:CG1	1:A:141:LEU:HD11	2.05	0.86
1:H:105:VAL:HG12	1:H:136:ILE:HD11	1.55	0.86
1:C:48:VAL:HG11	1:K:59:ILE:HD12	1.59	0.84
1:C:48:VAL:HG11	1:K:59:ILE:CD1	2.08	0.83
1:B:118:VAL:HG22	1:B:141:LEU:HD11	1.61	0.82
1:K:118:VAL:HG22	1:K:141:LEU:HD11	1.60	0.81
1:H:118:VAL:HG22	1:H:141:LEU:HD11	1.63	0.80
1:J:107:LEU:HD22	1:J:182:ILE:HD12	1.64	0.80
1:A:69:VAL:HG22	1:A:79:LEU:HD22	1.61	0.80
1:L:107:LEU:HD22	1:L:182:ILE:HD12	1.62	0.80
1:A:257:LEU:HD21	1:A:298:VAL:HG11	1.62	0.80
1:C:118:VAL:HG22	1:C:141:LEU:HD11	1.64	0.80
1:L:118:VAL:HG22	1:L:141:LEU:HD11	1.65	0.79
1:D:295:SER:OG	1:D:298:VAL:HG23	1.83	0.78
1:A:118:VAL:HG13	1:A:141:LEU:HD11	1.63	0.77
1:J:118:VAL:HG22	1:J:141:LEU:HD11	1.67	0.77
1:C:48:VAL:HG12	1:K:60:ILE:HG23	1.65	0.76
1:H:174:ILE:HD11	1:H:187:VAL:HG21	1.66	0.75
1:K:107:LEU:HD22	1:K:182:ILE:HD12	1.68	0.75
1:K:120:ILE:HG22	1:K:138:MET:HG2	1.69	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:118:VAL:HG22	1:I:141:LEU:HD11	1.67	0.74
1:I:120:ILE:HG22	1:I:138:MET:HG2	1.70	0.74
1:F:118:VAL:HG22	1:F:141:LEU:HD11	1.70	0.74
1:E:107:LEU:HD22	1:E:182:ILE:CD1	2.18	0.73
1:C:118:VAL:CG2	1:C:141:LEU:HD11	2.19	0.72
1:D:118:VAL:HG22	1:D:141:LEU:HD11	1.72	0.72
1:J:257:LEU:HD21	1:J:298:VAL:HG11	1.71	0.72
1:F:107:LEU:HD22	1:F:182:ILE:CD1	2.20	0.71
1:C:332:PRO:HB2	1:C:334:THR:HG23	1.72	0.71
1:A:70:LEU:HD21	1:A:80:GLN:HB2	1.72	0.71
1:K:257:LEU:HD21	1:K:298:VAL:HG11	1.73	0.70
1:G:257:LEU:HD21	1:G:298:VAL:HG11	1.71	0.70
1:J:174:ILE:HD11	1:J:187:VAL:HG21	1.74	0.69
1:D:120:ILE:HG22	1:D:138:MET:HG2	1.75	0.68
1:B:170:ILE:HG22	1:B:249:LEU:HD21	1.74	0.68
1:A:170:ILE:HG22	1:A:249:LEU:HD21	1.77	0.67
1:I:107:LEU:HD22	1:I:182:ILE:CD1	2.25	0.67
1:J:107:LEU:HD22	1:J:182:ILE:CD1	2.24	0.67
1:K:105:VAL:HG21	1:K:123:VAL:HG11	1.78	0.66
1:D:107:LEU:HD22	1:D:182:ILE:HD12	1.77	0.66
1:H:111:ALA:HB1	1:H:117:ILE:HD13	1.76	0.66
1:C:111:ALA:HB1	1:C:117:ILE:HD13	1.76	0.66
1:D:111:ALA:HB1	1:D:117:ILE:HD13	1.78	0.66
1:B:54:ILE:HG23	1:B:54:ILE:O	1.96	0.66
1:L:69:VAL:HG22	1:L:79:LEU:CD2	2.27	0.65
1:B:53:GLN:O	1:B:54:ILE:HG22	1.97	0.65
1:G:54:ILE:HG23	1:G:54:ILE:O	1.97	0.65
1:C:48:VAL:CG1	1:K:60:ILE:HG23	2.27	0.65
1:B:107:LEU:HD22	1:B:182:ILE:CD1	2.27	0.64
1:G:118:VAL:HG22	1:G:141:LEU:HD11	1.77	0.64
1:I:257:LEU:HD21	1:I:298:VAL:HG11	1.80	0.64
1:D:107:LEU:HD22	1:D:182:ILE:CD1	2.28	0.64
1:A:257:LEU:HD21	1:A:298:VAL:CG1	2.27	0.63
1:L:118:VAL:HG11	1:L:138:MET:HE2	1.80	0.63
1:G:74:ILE:O	1:G:75:ASN:CB	2.47	0.63
1:E:118:VAL:HG22	1:E:141:LEU:HD11	1.81	0.63
1:B:120:ILE:HG22	1:B:138:MET:HG2	1.80	0.63
1:L:257:LEU:HD21	1:L:298:VAL:HG11	1.81	0.63
1:L:69:VAL:HG22	1:L:79:LEU:HD22	1.81	0.62
1:G:167:MET:HG3	1:G:253:MET:HE2	1.79	0.62
1:F:295:SER:OG	1:F:298:VAL:HG23	2.00	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:72:LEU:HD13	1:G:73:GLY:N	2.15	0.62
1:A:253:MET:HE3	1:A:301:LEU:HD23	1.81	0.62
1:C:167:MET:HG3	1:C:253:MET:HE2	1.82	0.61
1:G:111:ALA:HB1	1:G:117:ILE:HD13	1.80	0.61
1:H:257:LEU:HD21	1:H:298:VAL:HG11	1.81	0.61
1:H:191:ASN:O	1:H:206:THR:HG22	2.01	0.61
1:K:107:LEU:HD22	1:K:182:ILE:CD1	2.30	0.61
1:F:74:ILE:O	1:F:75:ASN:CB	2.50	0.60
1:F:214:THR:HG21	1:F:242:LYS:HG3	1.83	0.60
1:L:118:VAL:HG11	1:L:138:MET:CE	2.31	0.60
1:I:74:ILE:O	1:I:75:ASN:CB	2.48	0.60
1:I:174:ILE:HD11	1:I:187:VAL:HG21	1.83	0.60
1:C:118:VAL:HG23	1:C:205:LEU:O	2.02	0.60
1:D:118:VAL:HG23	1:D:205:LEU:O	2.02	0.60
1:B:93:LYS:HE2	1:B:95:LEU:HD11	1.85	0.59
1:E:191:ASN:O	1:E:206:THR:HG22	2.01	0.59
1:J:199:PRO:O	1:J:200:ASN:HB3	2.02	0.59
1:F:257:LEU:HD21	1:F:298:VAL:HG11	1.84	0.59
1:J:118:VAL:HG11	1:J:138:MET:CE	2.32	0.59
1:D:328:SER:O	1:D:331:VAL:HG13	2.02	0.59
1:E:257:LEU:HD21	1:E:298:VAL:HG11	1.85	0.59
1:H:120:ILE:HG22	1:H:138:MET:HG2	1.85	0.58
1:G:105:VAL:HG21	1:G:123:VAL:HG11	1.85	0.58
1:J:105:VAL:HG12	1:J:136:ILE:HD11	1.85	0.58
1:B:59:ILE:HD12	1:D:48:VAL:HG21	1.84	0.58
1:G:118:VAL:HG21	1:G:206:THR:HB	1.85	0.58
1:I:170:ILE:HG22	1:I:249:LEU:HD21	1.86	0.58
1:C:120:ILE:HG22	1:C:138:MET:HG2	1.83	0.58
1:D:102:ARG:NH1	1:D:134:LEU:HD21	2.19	0.58
1:A:59:ILE:HG23	1:A:124:TYR:CG	2.38	0.58
1:B:193:LEU:HD13	2:B:1000:05B:H25	1.86	0.58
1:B:234:VAL:HG12	1:B:234:VAL:O	2.03	0.57
1:B:257:LEU:HD21	1:B:298:VAL:HG11	1.84	0.57
1:F:54:ILE:HG23	1:F:54:ILE:O	2.04	0.57
1:I:199:PRO:O	1:I:200:ASN:HB3	2.05	0.57
1:L:214:THR:HG21	1:L:242:LYS:HG3	1.86	0.57
1:B:59:ILE:HG23	1:B:124:TYR:CG	2.40	0.57
1:H:105:VAL:HG12	1:H:136:ILE:CD1	2.33	0.57
1:H:118:VAL:HG23	1:H:205:LEU:O	2.04	0.57
1:A:102:ARG:NH1	1:A:134:LEU:HD11	2.20	0.57
1:B:107:LEU:HD22	1:B:182:ILE:HD11	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:105:VAL:HG21	1:E:123:VAL:HG11	1.86	0.57
1:B:177:LEU:HD22	1:B:182:ILE:HG21	1.87	0.56
1:C:48:VAL:HG11	1:K:59:ILE:HD11	1.86	0.56
1:C:48:VAL:HG12	1:K:60:ILE:CG2	2.35	0.56
1:D:331:VAL:HG23	1:D:332:PRO:HD2	1.87	0.56
1:D:98:CYS:O	1:D:100:LYS:N	2.38	0.56
1:I:191:ASN:O	1:I:206:THR:HG22	2.04	0.56
1:A:48:VAL:HG21	1:J:59:ILE:CD1	2.36	0.56
1:J:98:CYS:O	1:J:100:LYS:N	2.38	0.56
1:A:69:VAL:HG22	1:A:79:LEU:CD2	2.33	0.56
1:E:54:ILE:O	1:E:54:ILE:HG23	2.06	0.56
1:J:118:VAL:HG23	1:J:205:LEU:O	2.05	0.56
1:C:170:ILE:HG22	1:C:249:LEU:HD21	1.88	0.55
1:E:170:ILE:HG22	1:E:249:LEU:HD21	1.88	0.55
1:G:253:MET:O	1:G:257:LEU:HD13	2.05	0.55
1:H:74:ILE:O	1:H:75:ASN:CB	2.53	0.55
1:B:174:ILE:HD11	1:B:187:VAL:HG21	1.88	0.55
1:H:59:ILE:HG23	1:H:124:TYR:CG	2.41	0.55
1:K:167:MET:HG3	1:K:253:MET:HE2	1.89	0.55
1:B:59:ILE:CD1	1:D:48:VAL:HG21	2.37	0.55
1:I:118:VAL:HG23	1:I:205:LEU:O	2.06	0.55
1:B:150:ILE:HD12	1:B:158:PHE:CE1	2.42	0.55
1:E:118:VAL:HG23	1:E:205:LEU:O	2.06	0.55
1:G:107:LEU:HD22	1:G:182:ILE:CD1	2.37	0.55
1:A:74:ILE:O	1:A:75:ASN:CB	2.55	0.55
1:E:147:PHE:HB3	1:E:342:LEU:HD21	1.89	0.55
1:E:59:ILE:CD1	1:E:126:ASN:HD22	2.21	0.54
1:A:48:VAL:HG21	1:J:59:ILE:HD12	1.90	0.54
1:C:111:ALA:HB1	1:C:117:ILE:CD1	2.37	0.54
1:E:118:VAL:HG11	1:E:138:MET:HE2	1.88	0.54
1:J:167:MET:HG3	1:J:253:MET:HE2	1.89	0.54
1:F:107:LEU:HD22	1:F:182:ILE:HD11	1.90	0.54
1:J:118:VAL:HG11	1:J:138:MET:HE2	1.90	0.54
1:G:150:ILE:HD12	1:G:158:PHE:CE1	2.43	0.54
1:L:199:PRO:O	1:L:200:ASN:HB3	2.07	0.54
1:K:191:ASN:O	1:K:206:THR:HG22	2.08	0.54
1:L:301:LEU:HD13	1:L:322:HIS:CD2	2.42	0.54
1:E:94:MET:O	1:E:95:LEU:HD13	2.07	0.54
1:E:120:ILE:HG22	1:E:138:MET:HG2	1.89	0.54
1:B:68:GLN:HG3	1:F:86:THR:HG22	1.90	0.54
1:G:120:ILE:HG22	1:G:138:MET:HG2	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:92:LEU:HD11	1:C:135:LEU:HB3	1.91	0.53
1:L:230:VAL:HG11	1:L:235:LEU:HD21	1.91	0.53
1:H:301:LEU:HD13	1:H:322:HIS:CD2	2.42	0.53
1:L:170:ILE:HG22	1:L:249:LEU:HD21	1.90	0.53
1:J:69:VAL:HG22	1:J:79:LEU:CD2	2.38	0.53
1:K:69:VAL:HG22	1:K:79:LEU:CD2	2.38	0.53
1:D:150:ILE:HD12	1:D:158:PHE:CE1	2.44	0.53
1:I:301:LEU:HD13	1:I:322:HIS:CD2	2.43	0.53
1:A:301:LEU:HD13	1:A:322:HIS:CD2	2.43	0.53
1:K:170:ILE:HG22	1:K:249:LEU:HD21	1.91	0.53
1:D:298:VAL:HG22	1:D:324:TRP:CD1	2.44	0.52
1:L:54:ILE:HG23	1:L:54:ILE:O	2.10	0.52
1:L:98:CYS:O	1:L:100:LYS:N	2.43	0.52
1:L:257:LEU:HA	1:L:336:LEU:HD13	1.91	0.52
1:B:160:GLU:HB2	1:B:334:THR:HG23	1.91	0.52
1:F:199:PRO:O	1:F:200:ASN:HB3	2.09	0.52
1:G:234:VAL:HG12	1:G:234:VAL:O	2.10	0.52
1:L:110:ARG:NH2	1:L:182:ILE:HD11	2.25	0.52
1:B:160:GLU:HA	1:B:336:LEU:HD11	1.93	0.51
1:A:150:ILE:HD12	1:A:158:PHE:CE1	2.45	0.51
1:L:92:LEU:HD11	1:L:135:LEU:HB3	1.92	0.51
1:L:167:MET:HG3	1:L:253:MET:HE2	1.90	0.51
1:G:48:VAL:HG21	1:I:59:ILE:HD12	1.92	0.51
1:G:111:ALA:HB1	1:G:117:ILE:CD1	2.41	0.51
1:C:191:ASN:O	1:C:206:THR:HG22	2.11	0.51
1:D:257:LEU:HD21	1:D:298:VAL:HG11	1.92	0.51
1:F:167:MET:HE2	1:F:253:MET:HB2	1.93	0.51
1:J:301:LEU:HD13	1:J:322:HIS:CD2	2.46	0.51
1:H:199:PRO:O	1:H:200:ASN:HB3	2.10	0.51
1:K:110:ARG:NH2	1:K:182:ILE:HD11	2.25	0.51
1:B:199:PRO:O	1:B:200:ASN:HB3	2.11	0.50
1:E:72:LEU:HD13	1:E:73:GLY:N	2.26	0.50
1:L:107:LEU:HD22	1:L:182:ILE:CD1	2.36	0.50
1:A:289:PRO:HB3	1:F:162:GLU:CD	2.32	0.50
1:D:59:ILE:HG23	1:D:124:TYR:CG	2.47	0.50
1:G:199:PRO:O	1:G:200:ASN:HB3	2.11	0.50
1:K:199:PRO:O	1:K:200:ASN:HB3	2.10	0.50
1:J:111:ALA:CB	1:J:177:LEU:HD21	2.41	0.50
1:D:111:ALA:HB1	1:D:117:ILE:CD1	2.39	0.50
1:I:166:ILE:HG21	1:I:256:LEU:HD11	1.93	0.50
1:K:92:LEU:HD11	1:K:135:LEU:HB3	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:174:ILE:HD11	1:E:187:VAL:HG21	1.93	0.50
1:K:54:ILE:HG23	1:K:54:ILE:O	2.12	0.50
1:C:150:ILE:HD12	1:C:158:PHE:CE1	2.47	0.49
1:E:167:MET:HG3	1:E:253:MET:HE2	1.95	0.49
1:J:110:ARG:NH2	1:J:182:ILE:HD11	2.27	0.49
1:A:105:VAL:HG21	1:A:123:VAL:HG11	1.94	0.49
1:L:146:LEU:HD13	1:L:203:LEU:HD22	1.95	0.49
1:K:59:ILE:HG23	1:K:124:TYR:CG	2.48	0.49
1:A:174:ILE:HD11	1:A:187:VAL:HG21	1.95	0.49
1:B:118:VAL:HG23	1:B:205:LEU:O	2.13	0.49
1:C:199:PRO:O	1:C:200:ASN:HB3	2.13	0.49
1:D:111:ALA:CB	1:D:177:LEU:HD21	2.43	0.49
1:F:90:PHE:CE2	1:F:121:VAL:HG11	2.47	0.49
1:H:92:LEU:HD11	1:H:135:LEU:HB3	1.95	0.49
1:I:92:LEU:HD11	1:I:135:LEU:HB3	1.95	0.49
1:A:93:LYS:HE2	1:A:95:LEU:HD11	1.94	0.48
1:C:59:ILE:HG23	1:C:124:TYR:CG	2.48	0.48
1:D:257:LEU:HA	1:D:336:LEU:HD13	1.95	0.48
1:H:111:ALA:HB1	1:H:117:ILE:CD1	2.41	0.48
1:I:94:MET:O	1:I:95:LEU:HD13	2.13	0.48
1:L:70:LEU:HD11	1:L:80:GLN:HB2	1.94	0.48
1:B:105:VAL:HG21	1:B:123:VAL:HG11	1.95	0.48
1:G:191:ASN:O	1:G:206:THR:HG22	2.13	0.48
1:G:59:ILE:HG23	1:G:124:TYR:CD1	2.48	0.48
1:E:52:LEU:HD11	1:E:123:VAL:HG23	1.96	0.48
1:L:120:ILE:HG22	1:L:138:MET:HG2	1.96	0.48
1:B:176:TYR:CE2	1:B:180:ILE:HD13	2.49	0.48
1:C:54:ILE:HG23	1:C:54:ILE:O	2.14	0.48
1:D:54:ILE:HG23	1:D:54:ILE:O	2.14	0.48
1:J:160:GLU:HB2	1:J:334:THR:HG23	1.96	0.48
1:D:75:ASN:CB	1:D:95:LEU:HD12	2.44	0.48
1:H:102:ARG:NH1	1:H:134:LEU:HD11	2.28	0.48
1:K:338:THR:O	1:K:342:LEU:HD13	2.14	0.48
1:B:92:LEU:HD11	1:B:135:LEU:HB3	1.96	0.47
1:B:160:GLU:CB	1:B:334:THR:HG23	2.44	0.47
1:B:191:ASN:O	1:B:206:THR:HG22	2.13	0.47
1:F:150:ILE:HD12	1:F:158:PHE:CE1	2.48	0.47
1:I:98:CYS:O	1:I:100:LYS:N	2.47	0.47
1:I:118:VAL:HG11	1:I:138:MET:HE2	1.96	0.47
1:A:259:GLY:HA2	1:A:338:THR:HG23	1.96	0.47
1:B:146:LEU:HD11	1:B:166:ILE:HD13	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:167:MET:HE3	1:G:249:LEU:HD22	1.95	0.47
1:I:54:ILE:HG23	1:I:54:ILE:O	2.14	0.47
1:J:120:ILE:HG22	1:J:138:MET:HG2	1.95	0.47
1:A:214:THR:HG21	1:A:242:LYS:HG3	1.96	0.47
1:G:48:VAL:HG21	1:I:59:ILE:CD1	2.44	0.47
1:E:59:ILE:HD11	1:E:126:ASN:HD22	1.79	0.47
1:F:159:THR:HG21	1:F:333:GLN:HE21	1.80	0.47
1:K:65:VAL:HA	1:K:81:ILE:HG22	1.97	0.47
1:A:59:ILE:HG23	1:A:124:TYR:CD2	2.50	0.47
1:H:98:CYS:O	1:H:100:LYS:N	2.48	0.47
1:L:81:ILE:HD11	1:L:137:VAL:HG13	1.97	0.47
1:C:70:LEU:HD11	1:C:80:GLN:HB2	1.97	0.47
1:J:54:ILE:O	1:J:54:ILE:HG23	2.15	0.47
1:J:92:LEU:HD11	1:J:135:LEU:HB3	1.97	0.47
1:A:52:LEU:HD21	1:A:105:VAL:HG22	1.97	0.46
1:D:98:CYS:O	1:D:99:PRO:C	2.53	0.46
1:H:257:LEU:HA	1:H:336:LEU:HD13	1.97	0.46
1:I:150:ILE:HD12	1:I:158:PHE:CE1	2.50	0.46
1:A:48:VAL:HG13	1:A:48:VAL:O	2.15	0.46
1:B:146:LEU:HD13	1:B:203:LEU:HD22	1.97	0.46
1:H:94:MET:O	1:H:95:LEU:HD13	2.16	0.46
1:C:253:MET:O	1:C:257:LEU:HD13	2.16	0.46
1:B:177:LEU:HD22	1:B:182:ILE:CG2	2.46	0.46
1:C:47:HIS:N	1:C:47:HIS:CD2	2.84	0.46
1:D:110:ARG:NH2	1:D:182:ILE:HD11	2.30	0.46
1:F:99:PRO:O	1:F:100:LYS:HB2	2.16	0.46
1:F:202:ILE:HD12	1:F:202:ILE:N	2.30	0.46
1:G:107:LEU:HD22	1:G:182:ILE:HD11	1.97	0.46
1:F:170:ILE:HG22	1:F:249:LEU:HD21	1.97	0.46
1:K:98:CYS:O	1:K:99:PRO:C	2.54	0.46
1:K:118:VAL:HG23	1:K:205:LEU:O	2.15	0.46
1:L:146:LEU:HD13	1:L:203:LEU:CD2	2.45	0.46
1:F:234:VAL:HG12	1:F:234:VAL:O	2.16	0.46
1:F:257:LEU:HD21	1:F:298:VAL:CG1	2.46	0.46
1:K:94:MET:O	1:K:95:LEU:HD13	2.16	0.46
1:F:59:ILE:CG1	1:F:135:LEU:HD23	2.46	0.46
1:F:59:ILE:HG23	1:F:124:TYR:CG	2.50	0.46
1:B:202:ILE:N	1:B:202:ILE:HD12	2.30	0.45
1:E:52:LEU:HD11	1:E:123:VAL:CG2	2.46	0.45
1:G:107:LEU:HD22	1:G:182:ILE:HD12	1.98	0.45
1:I:105:VAL:HG21	1:I:123:VAL:HG11	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:160:GLU:HB2	1:L:334:THR:HG23	1.98	0.45
1:L:59:ILE:HG23	1:L:124:TYR:CD1	2.51	0.45
1:E:234:VAL:HG12	1:E:234:VAL:O	2.17	0.45
1:G:105:VAL:CG2	1:G:123:VAL:HG21	2.47	0.45
1:A:253:MET:CE	1:A:301:LEU:HD23	2.47	0.45
1:B:81:ILE:HD11	1:B:137:VAL:HG13	1.98	0.45
1:F:120:ILE:HG22	1:F:138:MET:HG2	1.99	0.45
1:K:98:CYS:O	1:K:100:LYS:N	2.50	0.45
1:C:105:VAL:HG21	1:C:123:VAL:HG11	1.97	0.45
1:D:65:VAL:HA	1:D:81:ILE:HG22	1.99	0.45
1:B:167:MET:HG3	1:B:253:MET:HE2	1.99	0.45
1:G:110:ARG:NH2	1:G:182:ILE:HD11	2.32	0.45
1:E:65:VAL:HA	1:E:81:ILE:HG22	1.98	0.45
1:E:107:LEU:HD22	1:E:182:ILE:HD12	1.96	0.45
1:G:72:LEU:HD22	1:G:76:GLY:O	2.17	0.45
1:E:199:PRO:O	1:E:200:ASN:HB3	2.17	0.44
1:F:93:LYS:HE2	1:F:95:LEU:HD11	1.99	0.44
1:I:107:LEU:HD22	1:I:182:ILE:HD12	1.99	0.44
1:F:298:VAL:HG22	1:F:324:TRP:CD1	2.52	0.44
1:K:111:ALA:HB1	1:K:117:ILE:CD1	2.47	0.44
1:E:150:ILE:HD12	1:E:158:PHE:CE1	2.52	0.44
1:C:98:CYS:O	1:C:99:PRO:C	2.55	0.44
1:A:118:VAL:HG22	1:A:205:LEU:O	2.18	0.44
1:C:72:LEU:HD22	1:C:73:GLY:N	2.33	0.44
1:K:214:THR:HG21	1:K:242:LYS:HG3	1.99	0.44
1:A:118:VAL:HG12	1:A:141:LEU:HD11	1.96	0.44
1:D:174:ILE:HD11	1:D:187:VAL:HG21	2.00	0.44
1:C:72:LEU:HD22	1:C:73:GLY:H	1.82	0.43
1:D:199:PRO:O	1:D:200:ASN:CB	2.66	0.43
1:G:98:CYS:O	1:G:99:PRO:C	2.56	0.43
1:G:170:ILE:HG22	1:G:249:LEU:HD21	2.00	0.43
1:I:146:LEU:HD22	1:I:203:LEU:HD21	2.01	0.43
1:L:338:THR:O	1:L:342:LEU:HD23	2.18	0.43
1:C:72:LEU:C	1:C:72:LEU:HD13	2.38	0.43
1:A:126:ASN:HB2	1:A:135:LEU:HD21	1.99	0.43
1:B:74:ILE:O	1:B:75:ASN:CB	2.67	0.43
1:J:111:ALA:HB2	1:J:177:LEU:HD21	2.00	0.43
1:A:98:CYS:O	1:A:100:LYS:N	2.52	0.43
1:I:65:VAL:HA	1:I:81:ILE:HG22	2.00	0.43
1:I:102:ARG:HA	1:I:105:VAL:HG12	2.00	0.43
1:I:230:VAL:HG11	1:I:235:LEU:HD21	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:59:ILE:CD1	1:J:126:ASN:HD22	2.31	0.43
1:A:70:LEU:N	1:A:70:LEU:HD22	2.34	0.43
1:D:338:THR:O	1:D:342:LEU:HD13	2.19	0.43
1:I:59:ILE:HD12	1:I:59:ILE:H	1.83	0.43
1:C:110:ARG:HD2	1:K:127:LEU:HD22	2.01	0.43
1:I:167:MET:HG3	1:I:253:MET:HE2	2.01	0.43
1:J:111:ALA:HB2	1:J:177:LEU:CD2	2.49	0.43
1:H:199:PRO:O	1:H:200:ASN:CB	2.67	0.43
1:L:118:VAL:HG23	1:L:205:LEU:O	2.17	0.43
1:G:54:ILE:O	1:G:54:ILE:CG2	2.67	0.43
1:B:54:ILE:O	1:B:54:ILE:CG2	2.64	0.42
1:G:75:ASN:CB	1:G:95:LEU:HD12	2.49	0.42
1:L:59:ILE:HD12	1:L:59:ILE:H	1.84	0.42
1:A:54:ILE:HG23	1:A:54:ILE:O	2.19	0.42
1:G:257:LEU:CD2	1:G:298:VAL:HG11	2.44	0.42
1:D:176:TYR:CE2	1:D:180:ILE:HD13	2.54	0.42
1:D:202:ILE:HD12	1:D:202:ILE:N	2.34	0.42
1:G:107:LEU:HD13	1:G:182:ILE:HD12	2.01	0.42
1:L:52:LEU:HD11	1:L:123:VAL:CG2	2.49	0.42
1:C:58:ALA:HA	1:C:126:ASN:HD21	1.84	0.42
1:J:118:VAL:HG11	1:J:138:MET:HE3	2.00	0.42
1:K:147:PHE:CE1	1:K:255:ILE:HG22	2.54	0.42
1:B:59:ILE:HD11	1:D:48:VAL:HG11	2.01	0.42
1:C:257:LEU:HD21	1:C:298:VAL:HG11	2.01	0.42
1:E:98:CYS:O	1:E:100:LYS:N	2.53	0.42
1:F:160:GLU:HA	1:F:336:LEU:HD11	2.01	0.42
1:G:47:HIS:CD2	1:G:47:HIS:N	2.86	0.42
1:L:174:ILE:HD11	1:L:187:VAL:HG21	2.02	0.42
1:E:92:LEU:HD11	1:E:135:LEU:HB3	2.00	0.42
1:F:107:LEU:HD22	1:F:182:ILE:HD12	1.98	0.42
1:L:160:GLU:CB	1:L:334:THR:HG23	2.48	0.42
1:A:59:ILE:HG23	1:A:124:TYR:CD1	2.55	0.42
1:A:162:GLU:O	1:A:166:ILE:HG12	2.19	0.42
1:J:59:ILE:HG22	1:J:63:TYR:HB2	2.02	0.42
1:K:102:ARG:NH1	1:K:134:LEU:HD11	2.34	0.42
1:A:118:VAL:CG1	1:A:141:LEU:CD1	2.88	0.42
1:G:259:GLY:HA2	1:G:338:THR:HG23	2.02	0.42
1:A:289:PRO:HB3	1:F:162:GLU:OE2	2.20	0.41
1:E:259:GLY:HA2	1:E:338:THR:HG23	2.02	0.41
1:A:70:LEU:HD21	1:A:80:GLN:CB	2.45	0.41
1:A:110:ARG:HD2	1:J:127:LEU:HD22	2.00	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:145:GLU:HA	1:H:193:LEU:HD23	2.02	0.41
1:E:214:THR:HG21	1:E:242:LYS:HG3	2.01	0.41
1:I:328:SER:O	1:I:331:VAL:HG12	2.19	0.41
1:L:301:LEU:HD22	1:L:322:HIS:CE1	2.54	0.41
1:L:326:MET:CE	1:L:327:GLN:HE22	2.34	0.41
1:A:195:THR:HG23	1:A:202:ILE:O	2.20	0.41
1:A:199:PRO:O	1:A:200:ASN:CB	2.68	0.41
1:B:58:ALA:HA	1:B:126:ASN:HD21	1.84	0.41
1:D:111:ALA:HB2	1:D:177:LEU:HD21	2.03	0.41
1:E:108:HIS:CD2	1:E:120:ILE:HG23	2.55	0.41
1:F:110:ARG:NH2	1:F:182:ILE:HD11	2.34	0.41
1:L:150:ILE:HD12	1:L:158:PHE:CE1	2.55	0.41
1:C:174:ILE:HD11	1:C:187:VAL:HG21	2.02	0.41
1:F:118:VAL:HG23	1:F:205:LEU:O	2.20	0.41
1:G:328:SER:O	1:G:331:VAL:HG12	2.20	0.41
1:H:160:GLU:HB2	1:H:334:THR:HG23	2.02	0.41
1:I:152:ASP:C	1:J:198:ARG:HG3	2.41	0.41
1:K:111:ALA:HB1	1:K:117:ILE:HD12	2.02	0.41
1:L:105:VAL:HG21	1:L:123:VAL:HG11	2.02	0.41
1:L:332:PRO:HB2	1:L:334:THR:HG22	2.02	0.41
1:A:199:PRO:O	1:A:200:ASN:HB3	2.20	0.41
1:E:52:LEU:HD13	1:E:109:TRP:CE3	2.56	0.41
1:J:202:ILE:N	1:J:202:ILE:HD12	2.36	0.41
1:K:150:ILE:HD12	1:K:158:PHE:CE1	2.55	0.41
1:L:199:PRO:O	1:L:200:ASN:CB	2.68	0.41
1:A:108:HIS:CD2	1:A:120:ILE:HG23	2.55	0.41
1:B:108:HIS:CD2	1:B:120:ILE:HG23	2.55	0.41
1:G:181:ASN:HD22	1:G:215:THR:CG2	2.33	0.41
1:I:166:ILE:CG2	1:I:256:LEU:HD11	2.51	0.41
1:G:118:VAL:HG23	1:G:205:LEU:O	2.21	0.41
1:J:95:LEU:HD21	1:J:104:GLU:OE2	2.20	0.41
1:A:192:LEU:HD21	1:A:205:LEU:HD13	2.02	0.41
1:B:102:ARG:NH1	1:B:134:LEU:HD11	2.36	0.41
1:B:259:GLY:O	1:B:342:LEU:HD12	2.20	0.41
1:B:332:PRO:HB2	1:B:334:THR:HG22	2.02	0.41
1:C:202:ILE:N	1:C:202:ILE:HD12	2.35	0.41
1:J:111:ALA:HB1	1:J:117:ILE:CD1	2.50	0.41
1:K:118:VAL:CG2	1:K:141:LEU:HD11	2.41	0.41
1:A:170:ILE:CG2	1:A:249:LEU:HD21	2.49	0.41
1:B:59:ILE:H	1:B:126:ASN:HD21	1.67	0.41
1:B:146:LEU:HD13	1:B:203:LEU:CD2	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:199:PRO:O	1:E:200:ASN:CB	2.69	0.40
1:H:59:ILE:CG2	1:H:124:TYR:CD1	3.04	0.40
1:B:98:CYS:O	1:B:100:LYS:N	2.55	0.40
1:E:59:ILE:H	1:E:59:ILE:HD12	1.86	0.40
1:F:257:LEU:HD23	1:F:291:TRP:CZ3	2.56	0.40
1:G:59:ILE:HG23	1:G:124:TYR:CE1	2.57	0.40
1:H:54:ILE:HG23	1:H:54:ILE:O	2.21	0.40
1:H:150:ILE:HD12	1:H:158:PHE:CD1	2.56	0.40
1:J:199:PRO:O	1:J:200:ASN:CB	2.69	0.40
1:B:195:THR:HG23	1:B:202:ILE:O	2.21	0.40
1:E:111:ALA:HB1	1:E:117:ILE:HD13	2.03	0.40
1:H:202:ILE:HD12	1:H:202:ILE:N	2.36	0.40
1:L:111:ALA:CB	1:L:177:LEU:HD21	2.51	0.40
1:A:70:LEU:HD12	2:A:1000:05B:C27	2.52	0.40
1:C:69:VAL:O	1:C:70:LEU:HD23	2.22	0.40
1:F:128:TYR:O	1:F:129:ALA:HB3	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	262/318 (82%)	235 (90%)	19 (7%)	8 (3%)	4	16
1	B	262/318 (82%)	237 (90%)	17 (6%)	8 (3%)	4	16
1	C	262/318 (82%)	238 (91%)	16 (6%)	8 (3%)	4	16
1	D	262/318 (82%)	238 (91%)	15 (6%)	9 (3%)	3	15
1	E	262/318 (82%)	239 (91%)	15 (6%)	8 (3%)	4	16
1	F	262/318 (82%)	240 (92%)	12 (5%)	10 (4%)	3	13
1	G	262/318 (82%)	240 (92%)	15 (6%)	7 (3%)	5	19

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H	262/318 (82%)	239 (91%)	16 (6%)	7 (3%)	5	19
1	I	262/318 (82%)	239 (91%)	15 (6%)	8 (3%)	4	16
1	J	262/318 (82%)	243 (93%)	13 (5%)	6 (2%)	6	23
1	K	262/318 (82%)	242 (92%)	12 (5%)	8 (3%)	4	16
1	L	262/318 (82%)	237 (90%)	18 (7%)	7 (3%)	5	19
All	All	3144/3816 (82%)	2867 (91%)	183 (6%)	94 (3%)	4	17

All (94) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	100	LYS
1	A	200	ASN
1	B	100	LYS
1	B	200	ASN
1	C	99	PRO
1	C	200	ASN
1	D	99	PRO
1	E	100	LYS
1	E	200	ASN
1	F	100	LYS
1	F	200	ASN
1	G	99	PRO
1	H	100	LYS
1	H	200	ASN
1	J	99	PRO
1	K	99	PRO
1	K	200	ASN
1	L	100	LYS
1	L	200	ASN
1	A	54	ILE
1	A	75	ASN
1	A	99	PRO
1	C	100	LYS
1	D	54	ILE
1	D	100	LYS
1	D	158	PHE
1	D	200	ASN
1	E	54	ILE
1	F	75	ASN
1	F	158	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	G	75	ASN
1	G	158	PHE
1	G	200	ASN
1	H	54	ILE
1	H	75	ASN
1	H	99	PRO
1	I	54	ILE
1	I	75	ASN
1	I	99	PRO
1	I	100	LYS
1	I	200	ASN
1	J	100	LYS
1	J	200	ASN
1	K	54	ILE
1	K	100	LYS
1	L	54	ILE
1	L	99	PRO
1	A	158	PHE
1	B	99	PRO
1	B	129	ALA
1	C	54	ILE
1	C	158	PHE
1	C	207	ASP
1	D	129	ALA
1	E	75	ASN
1	E	99	PRO
1	F	90	PHE
1	G	100	LYS
1	K	90	PHE
1	L	158	PHE
1	A	129	ALA
1	A	207	ASP
1	B	75	ASN
1	B	90	PHE
1	D	89	LYS
1	F	54	ILE
1	F	129	ALA
1	I	90	PHE
1	I	129	ALA
1	I	158	PHE
1	J	54	ILE
1	K	158	PHE

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Mol	Chain	Res	Type
1	L	129	ALA
1	B	158	PHE
1	C	90	PHE
1	C	129	ALA
1	D	90	PHE
1	E	129	ALA
1	F	89	LYS
1	F	99	PRO
1	F	207	ASP
1	G	54	ILE
1	G	90	PHE
1	H	90	PHE
1	H	158	PHE
1	J	158	PHE
1	J	207	ASP
1	L	207	ASP
1	D	75	ASN
1	E	90	PHE
1	K	129	ALA
1	K	207	ASP
1	B	54	ILE
1	E	234	VAL

### 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	242/287 (84%)	232 (96%)	10 (4%)	30 64
1	B	242/287 (84%)	232 (96%)	10 (4%)	30 64
1	C	243/287 (85%)	234 (96%)	9 (4%)	34 68
1	D	241/287 (84%)	230 (95%)	11 (5%)	27 60
1	E	243/287 (85%)	232 (96%)	11 (4%)	27 61
1	F	241/287 (84%)	231 (96%)	10 (4%)	30 64
1	G	241/287 (84%)	225 (93%)	16 (7%)	16 44

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	240/287 (84%)	227 (95%)	13 (5%)	22	54
1	I	238/287 (83%)	229 (96%)	9 (4%)	33	67
1	J	242/287 (84%)	229 (95%)	13 (5%)	22	54
1	K	242/287 (84%)	235 (97%)	7 (3%)	42	76
1	L	244/287 (85%)	234 (96%)	10 (4%)	30	64
All	All	2899/3444 (84%)	2770 (96%)	129 (4%)	28	61

All (129) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	ILE
1	A	72	LEU
1	A	85	ARG
1	A	95	LEU
1	A	118	VAL
1	A	135	LEU
1	A	149	ARG
1	A	240	TYR
1	A	264	TYR
1	A	333	GLN
1	B	47	HIS
1	B	53	GLN
1	B	57	ASN
1	B	59	ILE
1	B	149	ARG
1	B	185	ARG
1	B	264	TYR
1	B	333	GLN
1	B	334	THR
1	B	343	LYS
1	C	47	HIS
1	C	49	LYS
1	C	59	ILE
1	C	95	LEU
1	C	131	ARG
1	C	149	ARG
1	C	198	ARG
1	C	264	TYR
1	C	340	ARG
1	D	47	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	D	57	ASN
1	D	59	ILE
1	D	95	LEU
1	D	131	ARG
1	D	135	LEU
1	D	149	ARG
1	D	264	TYR
1	D	331	VAL
1	D	333	GLN
1	D	344	GLU
1	E	57	ASN
1	E	59	ILE
1	E	149	ARG
1	E	198	ARG
1	E	240	TYR
1	E	264	TYR
1	E	285	GLU
1	E	333	GLN
1	E	340	ARG
1	E	342	LEU
1	E	344	GLU
1	F	59	ILE
1	F	102	ARG
1	F	135	LEU
1	F	149	ARG
1	F	152	ASP
1	F	198	ARG
1	F	240	TYR
1	F	264	TYR
1	F	327	GLN
1	F	334	THR
1	G	47	HIS
1	G	48	VAL
1	G	50	SER
1	G	54	ILE
1	G	57	ASN
1	G	59	ILE
1	G	95	LEU
1	G	149	ARG
1	G	152	ASP
1	G	198	ARG
1	G	240	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	G	264	TYR
1	G	327	GLN
1	G	333	GLN
1	G	340	ARG
1	G	342	LEU
1	H	47	HIS
1	H	48	VAL
1	H	49	LYS
1	H	59	ILE
1	H	135	LEU
1	H	149	ARG
1	H	240	TYR
1	H	264	TYR
1	H	277	THR
1	H	333	GLN
1	H	340	ARG
1	H	343	LYS
1	H	344	GLU
1	I	47	HIS
1	I	57	ASN
1	I	59	ILE
1	I	131	ARG
1	I	135	LEU
1	I	149	ARG
1	I	152	ASP
1	I	264	TYR
1	I	333	GLN
1	J	47	HIS
1	J	48	VAL
1	J	59	ILE
1	J	95	LEU
1	J	131	ARG
1	J	135	LEU
1	J	149	ARG
1	J	152	ASP
1	J	241	ASP
1	J	264	TYR
1	J	334	THR
1	J	340	ARG
1	J	343	LYS
1	K	53	GLN
1	K	57	ASN

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Mol	Chain	Res	Type
1	K	131	ARG
1	K	149	ARG
1	K	264	TYR
1	K	333	GLN
1	K	340	ARG
1	L	47	HIS
1	L	57	ASN
1	L	59	ILE
1	L	95	LEU
1	L	149	ARG
1	L	244	CYS
1	L	264	TYR
1	L	265	SER
1	L	334	THR
1	L	340	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (70) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	151	GLN
1	B	68	GLN
1	B	126	ASN
1	B	151	GLN
1	B	321	ASN
1	C	47	HIS
1	C	75	ASN
1	C	126	ASN
1	C	191	ASN
1	C	312	GLN
1	D	126	ASN
1	D	151	GLN
1	D	191	ASN
1	D	283	GLN
1	D	304	ASN
1	D	312	GLN
1	D	321	ASN
1	D	333	GLN
1	E	57	ASN
1	E	68	GLN
1	E	108	HIS
1	E	126	ASN
1	E	151	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	E	191	ASN
1	E	283	GLN
1	F	126	ASN
1	F	151	GLN
1	F	184	HIS
1	F	312	GLN
1	F	327	GLN
1	F	333	GLN
1	G	47	HIS
1	G	57	ASN
1	G	126	ASN
1	G	151	GLN
1	G	191	ASN
1	G	327	GLN
1	G	333	GLN
1	H	126	ASN
1	H	191	ASN
1	H	312	GLN
1	H	327	GLN
1	H	333	GLN
1	I	57	ASN
1	I	126	ASN
1	I	151	GLN
1	I	184	HIS
1	I	191	ASN
1	I	312	GLN
1	I	321	ASN
1	I	333	GLN
1	J	126	ASN
1	J	151	GLN
1	J	191	ASN
1	J	312	GLN
1	J	327	GLN
1	K	53	GLN
1	K	57	ASN
1	K	151	GLN
1	K	184	HIS
1	K	191	ASN
1	K	312	GLN
1	K	333	GLN
1	L	57	ASN
1	L	126	ASN

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Mol	Chain	Res	Type
1	L	151	GLN
1	L	312	GLN
1	L	321	ASN
1	L	327	GLN
1	L	333	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](#)

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](#)

2 ligands 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	$\# Z  > 2$
2	05B	A	1000	-	29,35,35	1.03	2 (6%)	26,52,52	2.20	9 (34%)
2	05B	B	1000	-	29,35,35	1.08	2 (6%)	26,52,52	2.12	8 (30%)

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
2	05B	A	1000	-	-	0/0/40/40	0/6/6/6
2	05B	B	1000	-	-	0/0/40/40	0/6/6/6

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1000	05B	C4-N3	2.65	1.36	1.34
2	B	1000	05B	C20-N19	-2.57	1.33	1.37
2	A	1000	05B	C20-N19	-2.36	1.33	1.37
2	A	1000	05B	C4-N3	2.30	1.35	1.34

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1000	05B	C17-C18-N19	-4.60	119.81	124.97
2	A	1000	05B	O30-C26-C25	4.46	131.57	128.10
2	A	1000	05B	C17-C18-N19	-4.40	120.04	124.97
2	B	1000	05B	O30-C26-C25	3.97	131.19	128.10
2	B	1000	05B	C9-C6-C1	3.69	113.51	109.17
2	A	1000	05B	C16-N21-C20	3.65	121.42	116.81
2	B	1000	05B	C18-N19-C20	3.53	120.84	116.64
2	A	1000	05B	C18-N19-C20	3.48	120.79	116.64
2	B	1000	05B	C16-N21-C20	3.47	121.19	116.81
2	B	1000	05B	C9-N5-C8	3.32	119.77	110.40
2	A	1000	05B	C8-C7-C1	3.19	112.92	109.17
2	A	1000	05B	O30-C29-O28	-3.17	103.12	108.09
2	A	1000	05B	C9-N5-C8	2.89	118.55	110.40
2	B	1000	05B	O30-C29-O28	-2.75	103.77	108.09
2	A	1000	05B	C9-C6-C1	2.67	112.31	109.17
2	B	1000	05B	O28-C27-C24	2.09	131.75	127.72
2	A	1000	05B	O28-C27-C24	2.07	131.71	127.72

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

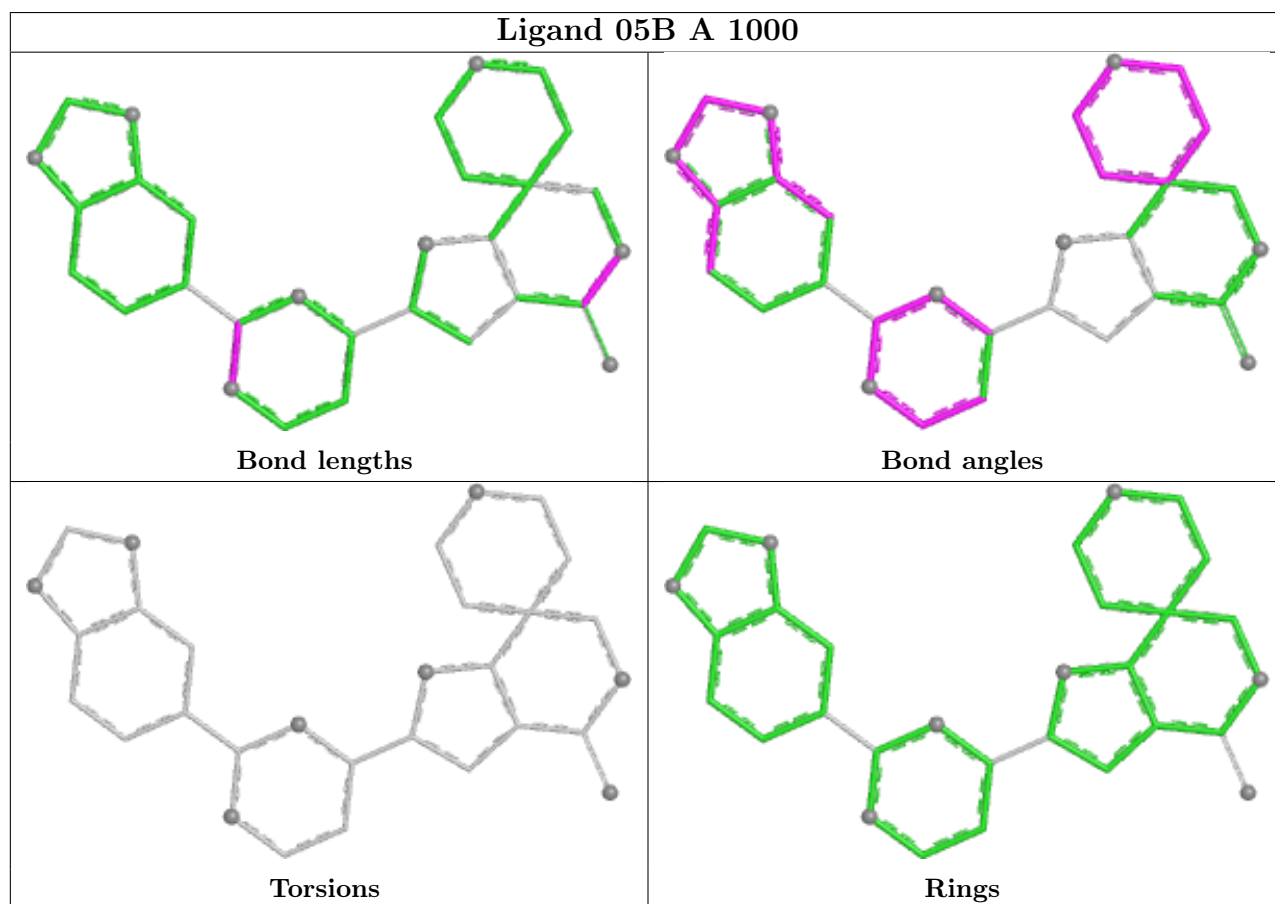
2 monomers are involved in 2 short contacts:

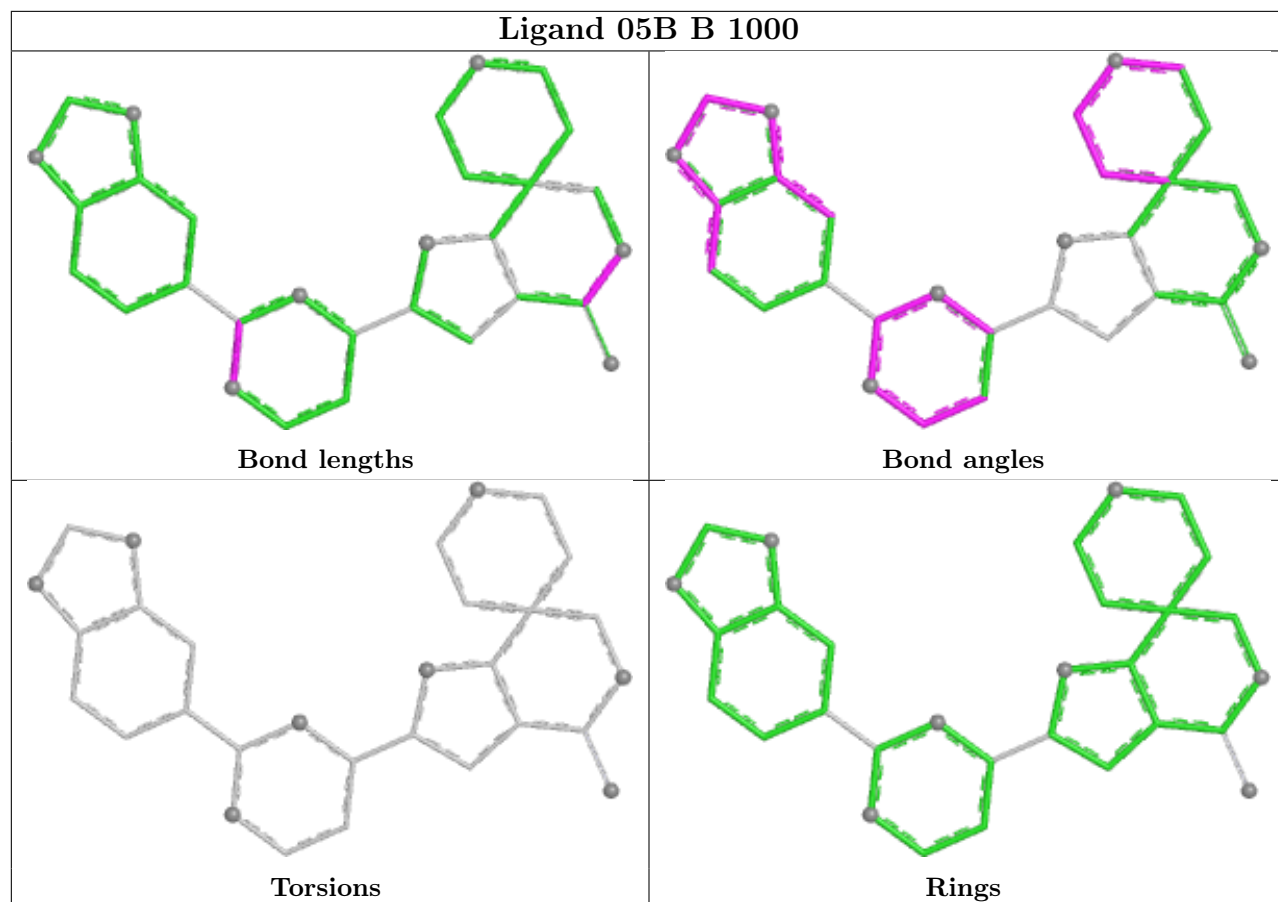
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1000	05B	1	0
2	B	1000	05B	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,



bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	272/318 (85%)	0.35	6 (2%) 62 59	76, 86, 104, 117	0
1	B	272/318 (85%)	0.45	9 (3%) 46 41	83, 93, 109, 129	0
1	C	272/318 (85%)	0.48	13 (4%) 30 27	80, 95, 122, 131	0
1	D	272/318 (85%)	0.49	8 (2%) 51 47	78, 89, 106, 113	0
1	E	272/318 (85%)	0.41	8 (2%) 51 47	85, 96, 118, 129	0
1	F	272/318 (85%)	0.50	11 (4%) 38 33	76, 89, 105, 115	0
1	G	272/318 (85%)	0.50	9 (3%) 46 41	87, 102, 123, 132	0
1	H	272/318 (85%)	0.65	23 (8%) 10 8	93, 110, 137, 154	0
1	I	272/318 (85%)	0.59	12 (4%) 34 30	101, 112, 125, 141	0
1	J	272/318 (85%)	0.44	14 (5%) 28 24	83, 96, 112, 125	0
1	K	272/318 (85%)	0.78	31 (11%) 5 3	104, 113, 137, 144	0
1	L	272/318 (85%)	0.54	13 (4%) 30 27	90, 105, 126, 138	0
All	All	3264/3816 (85%)	0.52	157 (4%) 30 27	76, 99, 125, 154	0

All (157) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	157	ALA	6.6
1	I	75	ASN	5.2
1	K	328	SER	5.0
1	L	66	THR	4.5
1	I	294	VAL	4.5
1	E	74	ILE	4.4
1	L	67	SER	4.4
1	K	146	LEU	4.1
1	L	228	TYR	4.1
1	H	157	ALA	4.0
1	H	158	PHE	4.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	K	331	VAL	4.0
1	K	150	ILE	3.9
1	K	257	LEU	3.8
1	J	345	ASP	3.8
1	H	334	THR	3.8
1	G	66	THR	3.8
1	H	228	TYR	3.7
1	F	73	GLY	3.7
1	G	65	VAL	3.6
1	K	199	PRO	3.6
1	K	158	PHE	3.6
1	K	294	VAL	3.5
1	I	240	TYR	3.5
1	J	240	TYR	3.5
1	K	336	LEU	3.5
1	J	75	ASN	3.3
1	F	59	ILE	3.3
1	G	82	PHE	3.2
1	B	342	LEU	3.2
1	J	334	THR	3.2
1	K	337	HIS	3.2
1	K	343	LYS	3.2
1	H	129	ALA	3.1
1	K	329	THR	3.1
1	J	228	TYR	3.1
1	J	157	ALA	3.1
1	H	343	LYS	3.1
1	C	87	GLN	3.0
1	I	74	ILE	3.0
1	H	336	LEU	3.0
1	K	202	ILE	3.0
1	C	66	THR	2.9
1	L	70	LEU	2.9
1	I	330	LYS	2.9
1	K	330	LYS	2.9
1	B	146	LEU	2.9
1	K	228	TYR	2.9
1	A	240	TYR	2.9
1	K	325	ILE	2.8
1	G	150	ILE	2.8
1	L	85	ARG	2.8
1	C	70	LEU	2.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	H	150	ILE	2.7
1	J	158	PHE	2.7
1	K	182	ILE	2.7
1	K	341	VAL	2.7
1	J	94	MET	2.7
1	L	82	PHE	2.7
1	F	79	LEU	2.7
1	I	336	LEU	2.7
1	B	289	PRO	2.6
1	H	289	PRO	2.6
1	H	151	GLN	2.6
1	E	107	LEU	2.6
1	C	67	SER	2.6
1	B	151	GLN	2.5
1	C	81	ILE	2.5
1	D	134	LEU	2.5
1	K	293	GLU	2.5
1	K	301	LEU	2.5
1	I	47	HIS	2.5
1	B	343	LYS	2.5
1	D	79	LEU	2.5
1	L	90	PHE	2.5
1	L	157	ALA	2.5
1	F	71	GLY	2.5
1	F	274	GLY	2.5
1	L	92	LEU	2.5
1	E	70	LEU	2.5
1	A	47	HIS	2.5
1	G	47	HIS	2.5
1	H	75	ASN	2.5
1	F	66	THR	2.5
1	I	69	VAL	2.4
1	H	342	LEU	2.4
1	D	197	LYS	2.4
1	E	79	LEU	2.4
1	J	342	LEU	2.4
1	H	333	GLN	2.4
1	F	70	LEU	2.4
1	B	150	ILE	2.4
1	C	202	ILE	2.4
1	H	47	HIS	2.4
1	E	157	ALA	2.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	K	333	GLN	2.3
1	K	201	ALA	2.3
1	H	131	ARG	2.3
1	C	135	LEU	2.3
1	H	293	GLU	2.3
1	L	329	THR	2.3
1	A	235	LEU	2.3
1	D	274	GLY	2.3
1	B	48	VAL	2.3
1	C	60	ILE	2.3
1	D	76	GLY	2.3
1	G	79	LEU	2.3
1	G	294	VAL	2.3
1	D	60	ILE	2.3
1	L	63	TYR	2.3
1	I	197	LYS	2.3
1	I	48	VAL	2.2
1	K	338	THR	2.2
1	G	157	ALA	2.2
1	C	69	VAL	2.2
1	K	340	ARG	2.2
1	H	315	THR	2.2
1	G	74	ILE	2.2
1	J	335	PRO	2.2
1	F	68	GLN	2.2
1	I	118	VAL	2.2
1	J	123	VAL	2.2
1	E	134	LEU	2.2
1	B	182	ILE	2.2
1	K	332	PRO	2.2
1	C	150	ILE	2.2
1	L	60	ILE	2.2
1	J	87	GLN	2.2
1	E	75	ASN	2.2
1	J	60	ILE	2.2
1	F	240	TYR	2.2
1	B	158	PHE	2.2
1	A	265	SER	2.2
1	H	229	TYR	2.2
1	L	336	LEU	2.1
1	H	335	PRO	2.1
1	C	92	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	336	LEU	2.1
1	A	150	ILE	2.1
1	H	344	GLU	2.1
1	A	48	VAL	2.1
1	J	336	LEU	2.1
1	C	74	ILE	2.1
1	H	199	PRO	2.1
1	F	182	ILE	2.1
1	C	64	LYS	2.1
1	K	48	VAL	2.1
1	F	333	GLN	2.0
1	K	151	GLN	2.0
1	K	256	LEU	2.0
1	H	170	ILE	2.0
1	I	299	LYS	2.0
1	K	197	LYS	2.0
1	E	94	MET	2.0
1	H	314	MET	2.0
1	K	80	GLN	2.0
1	D	75	ASN	2.0

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

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates [i](#)

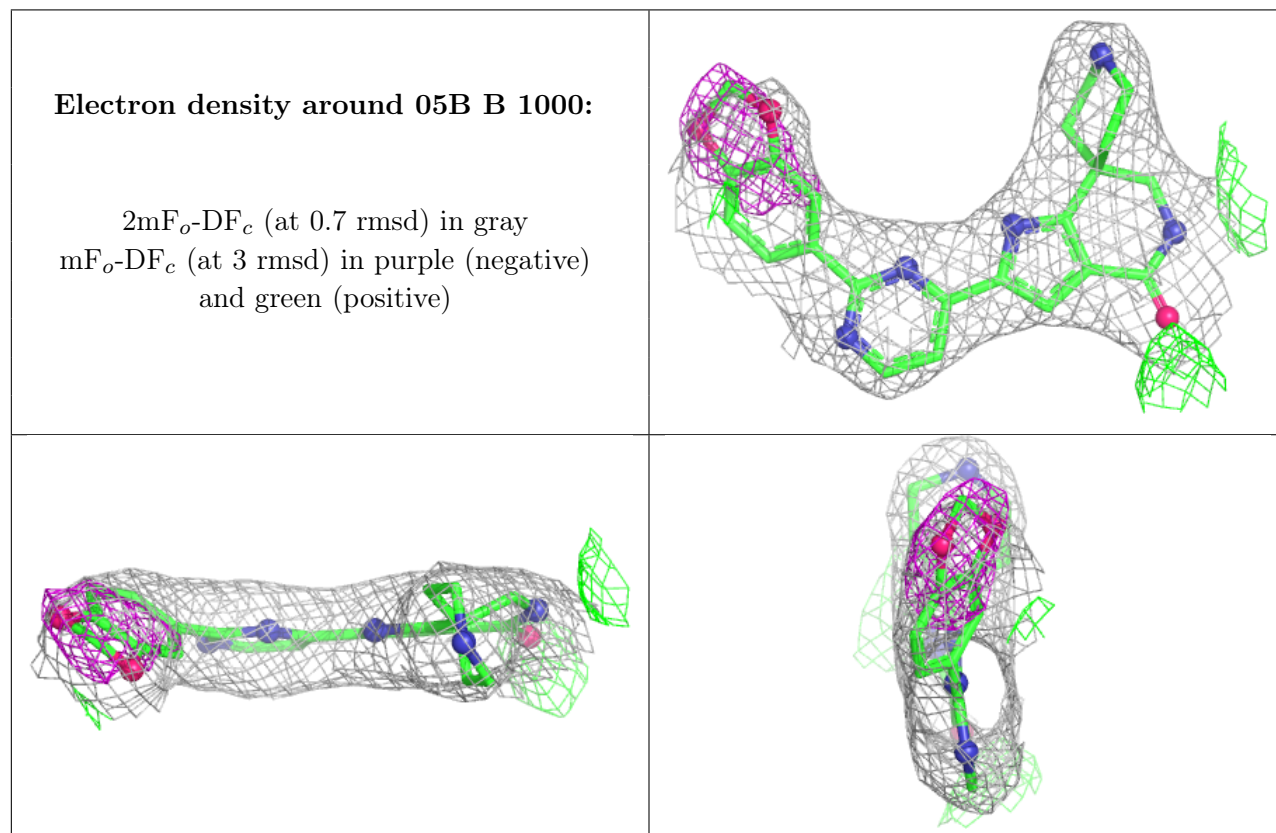
There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

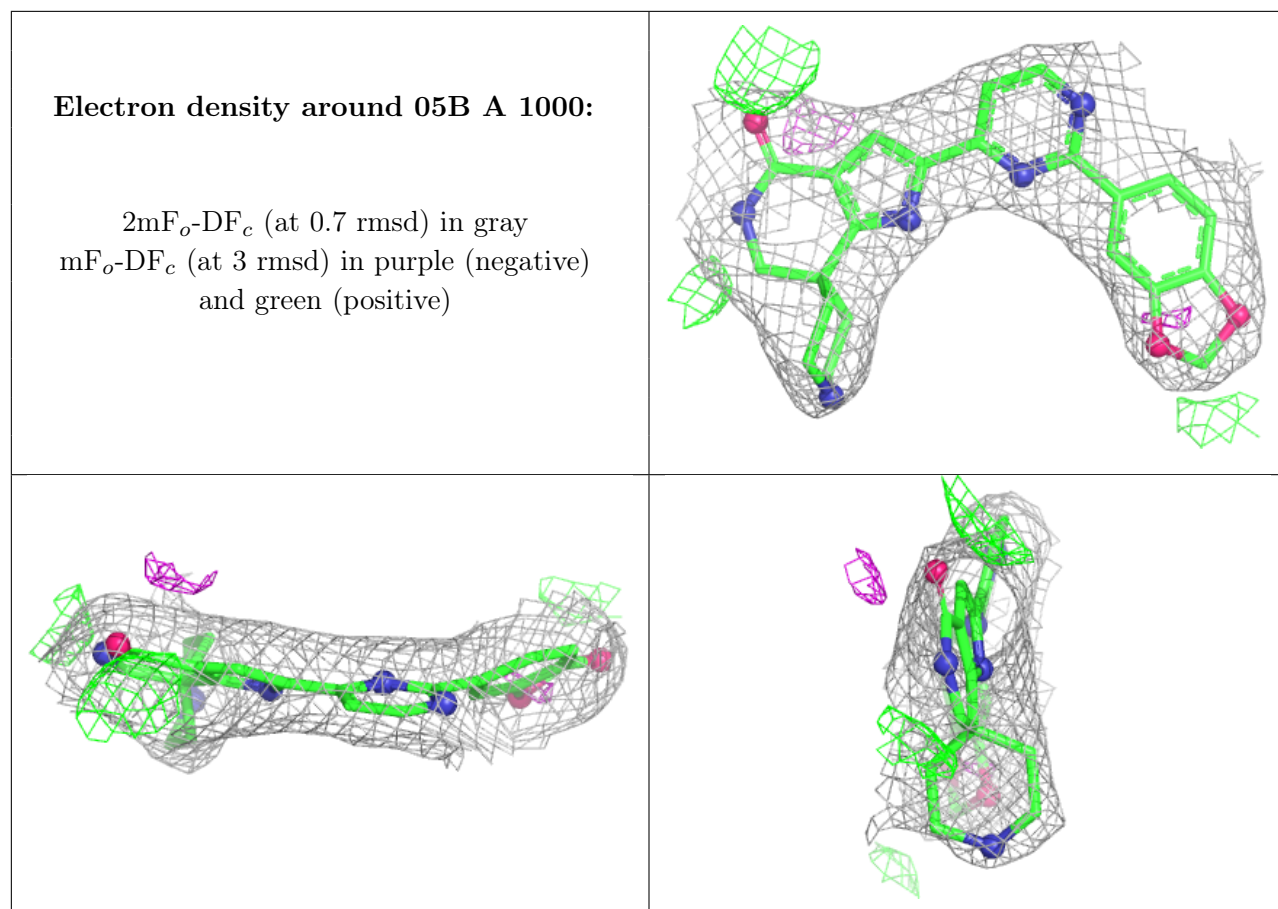
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	05B	B	1000	30/30	0.91	0.28	85,86,91,91	0
2	05B	A	1000	30/30	0.92	0.21	88,89,91,91	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.







## 6.5 Other polymers [i](#)

There are no such residues in this entry.