



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 11, 2024 – 09:48 PM EDT

PDB ID : 1HQC  
Title : STRUCTURE OF RUVB FROM THERMUS THERMOPHILUS HB8  
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Deposited on : 2000-12-15  
Resolution : 3.20 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  
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

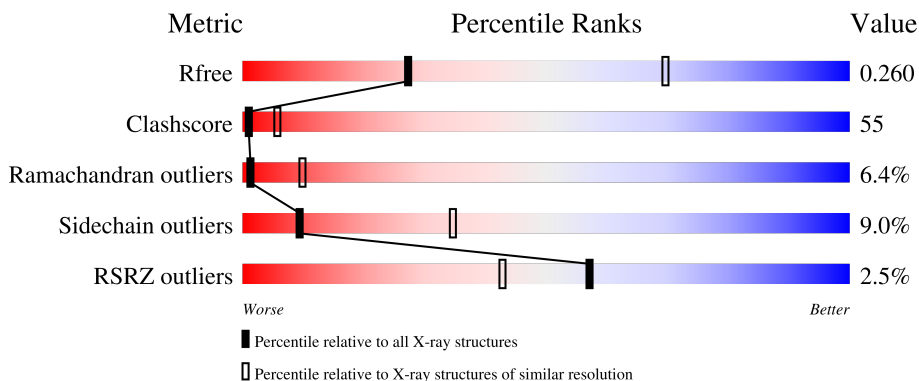
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.20 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	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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	324	
1	B	324	

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
3	ADE	A	501	-	-	-	X
3	ADE	B	502	-	-	-	X

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 4944 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.

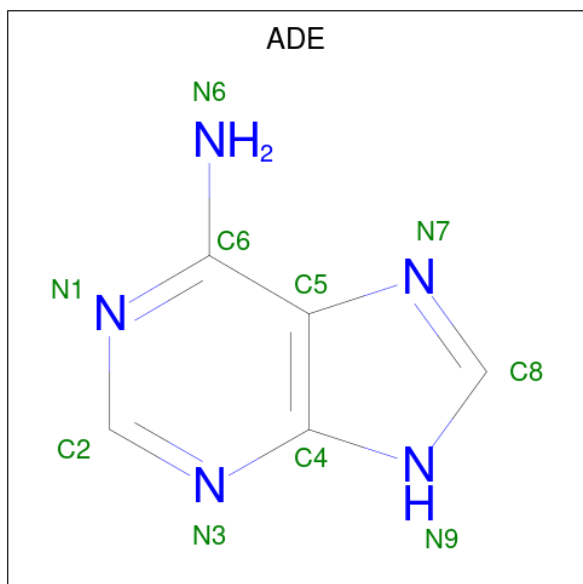
- Molecule 1 is a protein called RUVB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	314	Total 2461	C 1564	N 448	O 445	S 4	4	0	0
1	B	314	Total 2461	C 1564	N 448	O 445	S 4	0	0	0

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 3 is ADENINE (three-letter code: ADE) (formula: C<sub>5</sub>H<sub>5</sub>N<sub>5</sub>).

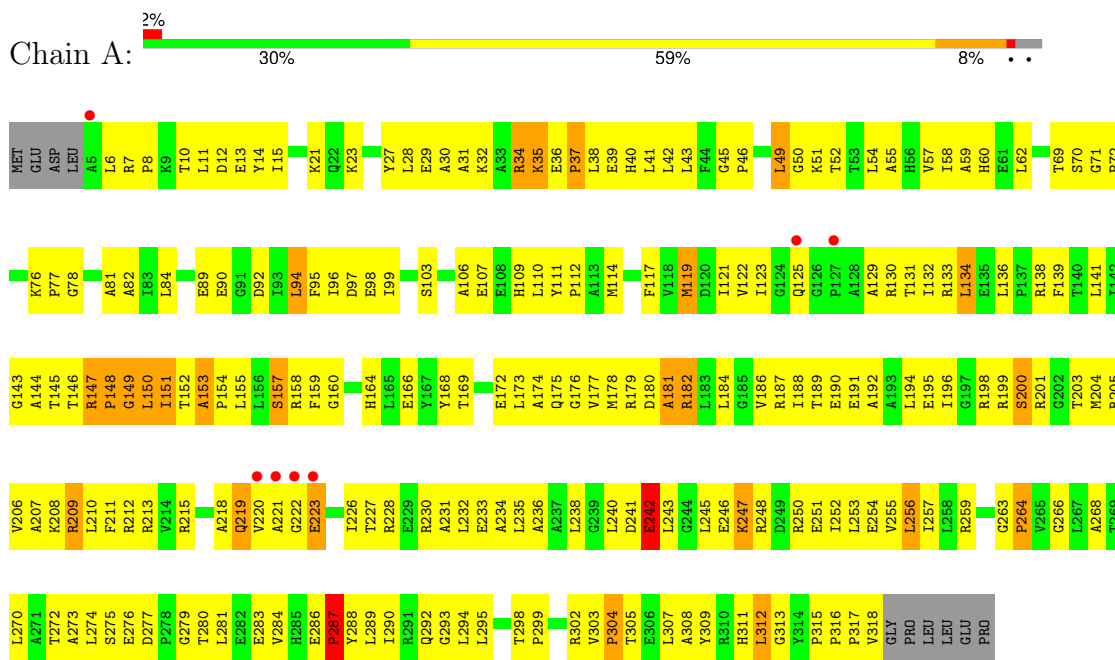


<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>			<b>ZeroOcc</b>	<b>AltConf</b>
3	A	1	Total	C	N	0	0
			10	5	5		
3	B	1	Total	C	N	0	0
			10	5	5		

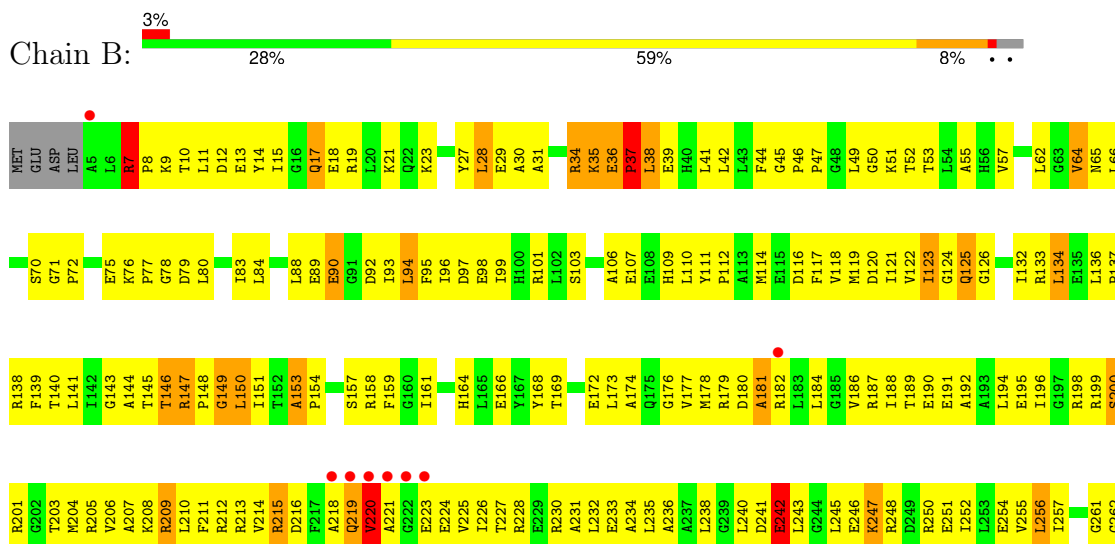
### 3 Residue-property plots i

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: RUVB



- Molecule 1: RUVB





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	84.86Å 84.86Å 355.24Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	12.00 – 3.20 11.94 – 3.19	Depositor EDS
% Data completeness (in resolution range)	(Not available) (12.00-3.20) 96.3 (11.94-3.19)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.51 (at 3.21Å)	Xtrriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.263 , 0.296 0.260 , 0.260	Depositor DCC
$R_{free}$ test set	1098 reflections (5.12%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	100.8	Xtrriage
Anisotropy	0.452	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 78.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	4944	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	103.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.25% 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: ADE, MG

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	0.46	0/2504	0.75	0/3389
1	B	0.43	0/2504	0.75	0/3389
All	All	0.44	0/5008	0.75	0/6778

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	2461	0	2555	254	0
1	B	2461	0	2555	298	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	10	0	4	1	0
3	B	10	0	4	0	0
All	All	4944	0	5118	548	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 55.

All (548) close contacts within the same asymmetric unit are listed below, sorted by their clash

magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:7:ARG:HB3	1:B:8:PRO:HD2	1.28	1.10
1:B:186:VAL:CB	1:B:221:ALA:HB1	1.83	1.09
1:B:210:LEU:HD11	1:B:240:LEU:HD11	1.32	1.08
1:B:147:ARG:HG3	1:B:147:ARG:HH11	1.19	1.06
1:A:35:LYS:C	1:A:37:PRO:HD2	1.79	1.03
1:A:111:TYR:HB2	1:A:112:PRO:HD3	1.36	1.03
1:B:186:VAL:HB	1:B:221:ALA:HB1	1.34	1.02
1:B:186:VAL:CG2	1:B:221:ALA:HB1	1.90	1.01
1:B:111:TYR:HB2	1:B:112:PRO:HD3	1.41	1.00
1:B:46:PRO:HG2	1:B:49:LEU:HD23	1.43	1.00
1:A:36:GLU:N	1:A:37:PRO:HD2	1.76	0.99
1:A:210:LEU:HD11	1:A:240:LEU:HD11	1.45	0.99
1:B:219:GLN:NE2	1:B:224:GLU:OE2	1.96	0.98
1:A:305:THR:HG23	1:A:308:ALA:H	1.29	0.95
1:B:227:THR:HG22	1:B:230:ARG:HG2	1.47	0.95
1:B:148:PRO:O	1:B:150:LEU:N	2.01	0.93
1:A:227:THR:HG22	1:A:230:ARG:HG2	1.46	0.93
1:B:218:ALA:O	1:B:219:GLN:HG2	1.69	0.91
1:B:30:ALA:O	1:B:34:ARG:HD3	1.71	0.90
1:A:84:LEU:HD21	1:A:94:LEU:HD12	1.52	0.90
1:A:10:THR:HG23	1:A:13:GLU:H	1.34	0.89
1:B:293:GLY:O	1:B:305:THR:HG21	1.74	0.87
1:B:7:ARG:HB3	1:B:8:PRO:CD	2.05	0.87
1:A:150:LEU:C	1:A:152:THR:H	1.75	0.87
1:B:89:GLU:HB3	1:B:92:ASP:OD2	1.74	0.86
1:A:149:GLY:C	1:A:151:ILE:H	1.73	0.86
1:A:70:SER:HB3	1:A:72:PRO:HD2	1.57	0.86
1:A:199:ARG:HG3	1:A:235:LEU:HD13	1.56	0.86
1:B:186:VAL:HB	1:B:221:ALA:CB	2.05	0.86
1:A:35:LYS:HB3	1:A:37:PRO:HD2	1.58	0.85
1:A:36:GLU:N	1:A:37:PRO:CD	2.37	0.84
1:A:294:LEU:HA	1:A:305:THR:CG2	2.08	0.84
1:A:219:GLN:HG3	1:A:223:GLU:HA	1.59	0.84
1:A:212:ARG:HA	1:A:215:ARG:NE	1.92	0.83
1:B:199:ARG:HG3	1:B:235:LEU:HD13	1.61	0.82
1:B:10:THR:HG23	1:B:13:GLU:H	1.42	0.82
1:B:64:VAL:CG2	1:B:92:ASP:HA	2.09	0.82
1:B:84:LEU:HD23	1:B:88:LEU:HD12	1.61	0.81
1:B:145:THR:HB	1:B:148:PRO:HB3	1.62	0.80
1:A:293:GLY:O	1:A:305:THR:HG21	1.81	0.80
1:A:145:THR:HG22	1:A:147:ARG:N	1.96	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:186:VAL:HG21	1:B:221:ALA:HB1	1.63	0.79
1:A:246:GLU:HG3	1:A:247:LYS:HD3	1.64	0.79
1:B:147:ARG:HH11	1:B:147:ARG:CG	1.97	0.78
1:B:38:LEU:HB2	1:B:62:LEU:HD11	1.65	0.78
1:B:212:ARG:HA	1:B:215:ARG:NE	1.98	0.78
1:A:305:THR:HG23	1:A:308:ALA:N	1.97	0.78
1:A:212:ARG:HA	1:A:215:ARG:HE	1.48	0.78
1:B:286:GLU:O	1:B:290:ILE:HG13	1.83	0.78
1:B:64:VAL:HG21	1:B:92:ASP:HA	1.65	0.77
1:B:125:GLN:HG3	1:B:126:GLY:H	1.50	0.76
1:B:107:GLU:HG2	1:B:111:TYR:HE1	1.50	0.76
1:B:147:ARG:HG3	1:B:147:ARG:NH1	1.99	0.76
1:B:223:GLU:CD	1:B:223:GLU:H	1.89	0.75
1:B:210:LEU:HD11	1:B:240:LEU:CD1	2.15	0.75
1:A:195:GLU:HG2	1:A:232:LEU:HD21	1.70	0.74
1:B:188:ILE:HG23	1:B:226:ILE:O	1.87	0.74
1:B:64:VAL:HG23	1:B:92:ASP:OD1	1.88	0.74
1:A:130:ARG:NH1	1:A:130:ARG:HB3	2.04	0.73
1:A:149:GLY:C	1:A:151:ILE:N	2.43	0.72
1:A:199:ARG:HG2	1:A:199:ARG:HH11	1.55	0.72
1:B:180:ASP:OD2	1:B:208:LYS:HE3	1.90	0.72
1:B:212:ARG:HA	1:B:215:ARG:HE	1.55	0.72
1:A:77:PRO:HB3	1:A:109:HIS:CD2	2.25	0.72
1:A:153:ALA:HB1	1:A:154:PRO:CD	2.18	0.72
1:A:28:LEU:O	1:A:31:ALA:N	2.21	0.72
1:A:189:THR:HB	1:A:191:GLU:OE2	1.90	0.72
1:A:294:LEU:HA	1:A:305:THR:HG22	1.71	0.71
1:B:151:ILE:HG12	1:B:151:ILE:O	1.88	0.71
1:B:153:ALA:CB	1:B:154:PRO:CD	2.68	0.71
1:A:252:ILE:HG12	1:A:274:LEU:HD21	1.73	0.71
1:B:28:LEU:O	1:B:31:ALA:N	2.16	0.71
1:A:210:LEU:HD11	1:A:240:LEU:CD1	2.20	0.71
1:A:123:ILE:O	1:A:129:ALA:HB1	1.91	0.71
1:A:35:LYS:HB3	1:A:37:PRO:CD	2.20	0.71
1:A:145:THR:HG22	1:A:147:ARG:H	1.53	0.71
1:B:173:LEU:HD22	1:B:207:ALA:HB2	1.74	0.70
1:A:15:ILE:HG13	1:A:175:GLN:HE21	1.56	0.69
1:A:294:LEU:HA	1:A:305:THR:HG21	1.72	0.69
1:B:246:GLU:HG3	1:B:247:LYS:HD3	1.75	0.69
1:A:7:ARG:HB2	1:A:8:PRO:HD2	1.75	0.68
1:B:51:LYS:HD2	1:B:144:ALA:HB1	1.75	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:257:ILE:HD12	1:A:312:LEU:HD12	1.74	0.68
1:B:189:THR:HB	1:B:191:GLU:OE2	1.93	0.68
1:A:71:GLY:N	1:A:72:PRO:CD	2.57	0.68
1:A:153:ALA:CB	1:A:154:PRO:CD	2.72	0.68
1:B:220:VAL:O	1:B:220:VAL:HG22	1.93	0.68
1:A:111:TYR:CB	1:A:112:PRO:HD3	2.20	0.67
1:B:121:ILE:HD11	1:B:134:LEU:HD11	1.76	0.67
1:A:247:LYS:HG2	1:A:248:ARG:H	1.60	0.67
1:A:276:GLU:HG3	1:A:277:ASP:N	2.10	0.67
1:B:103:SER:HB2	1:B:106:ALA:CB	2.25	0.67
1:B:305:THR:HG23	1:B:308:ALA:H	1.60	0.66
1:B:203:THR:HG22	1:B:206:VAL:H	1.60	0.66
1:B:42:LEU:HB2	1:B:159:PHE:CD2	2.31	0.66
1:A:295:LEU:HD12	1:A:303:VAL:O	1.95	0.66
1:B:11:LEU:HA	1:B:57:VAL:HG11	1.77	0.66
1:A:41:LEU:HD11	1:A:43:LEU:CD2	2.26	0.65
1:A:11:LEU:HA	1:A:57:VAL:HG11	1.77	0.65
1:B:219:GLN:HG3	1:B:230:ARG:NH2	2.11	0.65
1:A:51:LYS:HD2	1:A:144:ALA:HB1	1.77	0.65
1:B:187:ARG:C	1:B:188:ILE:HD12	2.17	0.65
1:A:150:LEU:C	1:A:152:THR:N	2.48	0.65
1:B:103:SER:HB2	1:B:106:ALA:HB3	1.79	0.65
1:B:181:ALA:O	1:B:184:LEU:N	2.26	0.65
1:B:195:GLU:HG2	1:B:232:LEU:HD21	1.78	0.65
1:B:219:GLN:HG3	1:B:230:ARG:HH22	1.60	0.65
1:B:227:THR:HG22	1:B:230:ARG:CG	2.26	0.65
1:B:125:GLN:HG3	1:B:126:GLY:N	2.11	0.65
1:A:23:LYS:O	1:A:27:TYR:CD1	2.49	0.64
1:B:294:LEU:HA	1:B:305:THR:HG22	1.78	0.64
1:A:153:ALA:HB1	1:A:154:PRO:HD3	1.79	0.64
1:A:180:ASP:OD2	1:A:208:LYS:HE3	1.97	0.64
1:B:125:GLN:CG	1:B:126:GLY:H	2.07	0.63
1:B:153:ALA:HB1	1:B:154:PRO:CD	2.28	0.63
1:A:111:TYR:HB2	1:A:112:PRO:CD	2.20	0.63
1:A:188:ILE:HG12	1:A:192:ALA:HB3	1.81	0.63
1:A:247:LYS:HG2	1:A:248:ARG:N	2.12	0.63
1:A:42:LEU:HB2	1:A:159:PHE:CD2	2.33	0.63
1:B:101:ARG:HG2	1:B:101:ARG:HH11	1.64	0.63
1:B:241:ASP:C	1:B:243:LEU:H	2.02	0.62
1:B:257:ILE:HD12	1:B:312:LEU:HD12	1.80	0.62
1:A:107:GLU:HG2	1:A:111:TYR:HE1	1.63	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:149:GLY:O	1:A:151:ILE:N	2.32	0.62
1:A:10:THR:CG2	1:A:13:GLU:HG3	2.30	0.62
1:B:84:LEU:HD23	1:B:88:LEU:CD1	2.29	0.62
1:A:169:THR:OG1	1:A:172:GLU:HG3	1.99	0.62
1:A:41:LEU:HD11	1:A:43:LEU:HD21	1.82	0.62
1:A:203:THR:HG22	1:A:206:VAL:H	1.64	0.62
1:B:218:ALA:C	1:B:219:GLN:HG2	2.20	0.62
1:A:203:THR:CG2	1:A:205:ARG:HB3	2.30	0.62
1:B:34:ARG:HB2	1:B:35:LYS:HD2	1.80	0.62
1:B:145:THR:HG21	1:B:148:PRO:HA	1.80	0.62
1:B:294:LEU:HA	1:B:305:THR:CG2	2.30	0.62
1:A:305:THR:CG2	1:A:308:ALA:H	2.10	0.61
1:B:199:ARG:HH11	1:B:199:ARG:HG2	1.65	0.61
1:B:201:ARG:C	1:B:203:THR:H	2.03	0.61
1:B:46:PRO:CG	1:B:49:LEU:HD23	2.27	0.61
1:B:42:LEU:HD12	1:B:143:GLY:O	2.01	0.60
1:B:242:GLU:N	1:B:242:GLU:OE1	2.34	0.60
1:A:149:GLY:O	1:A:151:ILE:HG22	2.02	0.60
1:B:201:ARG:HG2	1:B:288:TYR:CE1	2.35	0.60
1:B:295:LEU:HD12	1:B:303:VAL:O	2.01	0.60
1:A:89:GLU:HG2	1:A:92:ASP:OD2	2.01	0.60
1:A:114:MET:HE3	1:A:141:LEU:HB3	1.82	0.60
1:B:219:GLN:O	1:B:220:VAL:C	2.39	0.60
1:B:257:ILE:HG23	1:B:309:TYR:CE1	2.36	0.60
1:B:7:ARG:HE	1:B:7:ARG:HA	1.67	0.60
1:B:153:ALA:HB1	1:B:154:PRO:HD3	1.82	0.60
1:A:212:ARG:HG3	1:A:215:ARG:HH21	1.67	0.60
1:B:228:ARG:HH11	1:B:228:ARG:HB3	1.67	0.60
1:B:295:LEU:HD12	1:B:296:LYS:H	1.67	0.60
1:B:132:ILE:HD12	1:B:132:ILE:O	2.02	0.59
1:B:188:ILE:CG2	1:B:192:ALA:HB3	2.31	0.59
1:B:147:ARG:CG	1:B:147:ARG:NH1	2.61	0.59
1:A:38:LEU:HD23	1:A:39:GLU:N	2.17	0.59
1:B:188:ILE:HG22	1:B:189:THR:N	2.18	0.59
1:A:121:ILE:HG21	1:A:134:LEU:HD21	1.84	0.59
1:B:247:LYS:HG2	1:B:248:ARG:N	2.17	0.59
1:A:174:ALA:HB2	1:A:194:LEU:HA	1.83	0.59
1:A:195:GLU:HG2	1:A:232:LEU:CD2	2.32	0.59
1:B:111:TYR:HB2	1:B:112:PRO:CD	2.24	0.59
1:B:84:LEU:HD21	1:B:94:LEU:HD12	1.84	0.59
1:B:84:LEU:HA	1:B:88:LEU:HD12	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:117:PHE:CD2	1:B:138:ARG:HA	2.38	0.58
1:B:212:ARG:HG3	1:B:215:ARG:HH21	1.69	0.58
1:A:84:LEU:CD2	1:A:94:LEU:HD12	2.31	0.58
1:B:151:ILE:O	1:B:151:ILE:CG1	2.51	0.58
1:B:174:ALA:HB2	1:B:194:LEU:HA	1.86	0.58
1:A:35:LYS:CB	1:A:37:PRO:HD2	2.31	0.58
1:B:10:THR:CG2	1:B:13:GLU:HG3	2.33	0.58
1:A:114:MET:HE1	1:A:141:LEU:HD22	1.86	0.58
1:A:97:ASP:OD2	1:A:98:GLU:N	2.37	0.57
1:A:231:ALA:O	1:A:234:ALA:HB3	2.04	0.57
1:B:227:THR:CG2	1:B:230:ARG:HG2	2.30	0.57
1:B:186:VAL:CB	1:B:221:ALA:CB	2.69	0.57
1:B:64:VAL:CG2	1:B:65:ASN:N	2.67	0.57
1:B:220:VAL:O	1:B:220:VAL:CG2	2.52	0.56
1:B:153:ALA:HB3	1:B:154:PRO:HD2	1.87	0.56
1:B:233:GLU:O	1:B:236:ALA:HB3	2.06	0.56
1:A:241:ASP:C	1:A:243:LEU:H	2.07	0.56
1:B:77:PRO:HB3	1:B:109:HIS:CD2	2.39	0.56
1:A:252:ILE:HD13	1:A:281:LEU:CD1	2.36	0.56
1:B:194:LEU:HD23	1:B:194:LEU:O	2.06	0.56
1:B:196:ILE:HG23	1:B:210:LEU:HD23	1.88	0.56
1:A:38:LEU:HD12	1:A:62:LEU:HD11	1.88	0.56
1:B:314:TYR:HB3	1:B:315:PRO:HD2	1.87	0.56
1:A:15:ILE:N	1:A:15:ILE:HD12	2.21	0.56
1:A:228:ARG:HB3	1:A:228:ARG:HH11	1.70	0.56
1:B:158:ARG:HG3	1:B:158:ARG:HH11	1.71	0.56
1:B:247:LYS:HG2	1:B:248:ARG:H	1.71	0.56
1:A:123:ILE:HD12	1:B:121:ILE:HG23	1.88	0.56
1:A:114:MET:CE	1:A:141:LEU:HD22	2.37	0.55
1:B:49:LEU:CD1	1:B:168:TYR:HE1	2.19	0.55
1:B:117:PHE:CE2	1:B:138:ARG:HA	2.41	0.55
1:A:30:ALA:O	1:A:34:ARG:CG	2.54	0.55
1:B:119:MET:O	1:B:134:LEU:HD12	2.07	0.55
1:A:194:LEU:O	1:A:194:LEU:HD23	2.06	0.55
1:B:264:PRO:HA	1:B:303:VAL:HG12	1.88	0.55
1:A:90:GLU:HG3	1:A:138:ARG:H	1.70	0.55
1:A:188:ILE:HG13	1:A:226:ILE:O	2.06	0.55
1:B:52:THR:O	1:B:55:ALA:HB3	2.06	0.55
1:B:241:ASP:CG	1:B:250:ARG:HH11	2.10	0.55
1:A:227:THR:CG2	1:A:230:ARG:HG2	2.31	0.55
1:A:257:ILE:HG23	1:A:309:TYR:CE1	2.41	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:35:LYS:HD2	1:B:35:LYS:H	1.71	0.55
1:A:42:LEU:HD12	1:A:143:GLY:O	2.07	0.55
1:A:103:SER:HB2	1:A:106:ALA:CB	2.37	0.55
1:A:173:LEU:HD22	1:A:207:ALA:HB2	1.89	0.55
1:B:186:VAL:HG21	1:B:221:ALA:CB	2.35	0.55
1:A:196:ILE:HG23	1:A:210:LEU:HD23	1.89	0.54
1:B:201:ARG:HG2	1:B:288:TYR:CZ	2.41	0.54
1:B:36:GLU:N	1:B:37:PRO:HD3	2.21	0.54
1:A:251:GLU:O	1:A:254:GLU:HB3	2.06	0.54
1:B:90:GLU:CG	1:B:138:ARG:H	2.20	0.54
1:B:293:GLY:O	1:B:305:THR:CG2	2.53	0.54
1:B:195:GLU:O	1:B:199:ARG:HG2	2.07	0.54
1:A:46:PRO:CG	1:A:49:LEU:HD23	2.38	0.54
1:A:132:ILE:HG22	1:A:133:ARG:N	2.22	0.54
1:A:150:LEU:O	1:A:152:THR:N	2.40	0.54
1:B:196:ILE:CG2	1:B:210:LEU:HD23	2.38	0.54
1:A:311:HIS:C	1:A:313:GLY:H	2.10	0.54
1:A:39:GLU:HB3	1:A:160:GLY:HA3	1.89	0.54
1:A:270:LEU:HD23	1:A:281:LEU:HD21	1.90	0.54
1:B:84:LEU:HB3	1:B:136:LEU:HD22	1.89	0.54
1:B:90:GLU:HG3	1:B:138:ARG:H	1.72	0.54
1:B:231:ALA:O	1:B:234:ALA:HB3	2.08	0.54
1:A:148:PRO:O	1:A:149:GLY:O	2.26	0.54
1:A:147:ARG:HB3	1:A:151:ILE:HG21	1.88	0.53
1:B:35:LYS:HB2	1:B:37:PRO:HD3	1.90	0.53
1:B:195:GLU:HG2	1:B:232:LEU:CD2	2.39	0.53
1:A:35:LYS:C	1:A:37:PRO:CD	2.67	0.53
1:A:119:MET:HE2	1:A:136:LEU:HD11	1.91	0.53
1:B:97:ASP:OD2	1:B:98:GLU:N	2.40	0.53
1:B:109:HIS:O	1:B:112:PRO:HD2	2.09	0.53
1:B:169:THR:OG1	1:B:172:GLU:HG3	2.08	0.53
1:B:188:ILE:HG22	1:B:192:ALA:HB3	1.90	0.53
1:A:242:GLU:OE1	1:A:242:GLU:N	2.41	0.53
1:A:266:GLY:H	1:A:302:ARG:H	1.57	0.53
1:B:49:LEU:HD12	1:B:168:TYR:HE1	1.74	0.53
1:B:257:ILE:O	1:B:261:GLY:HA2	2.07	0.53
1:A:178:MET:SD	1:A:190:GLU:HA	2.48	0.53
1:A:201:ARG:C	1:A:203:THR:H	2.10	0.53
1:B:146:THR:C	1:B:148:PRO:HD3	2.28	0.53
1:B:214:VAL:C	1:B:216:ASP:H	2.11	0.53
1:A:130:ARG:HB3	1:A:130:ARG:CZ	2.38	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:196:ILE:CG2	1:A:210:LEU:HD23	2.39	0.53
1:B:149:GLY:C	1:B:151:ILE:N	2.62	0.53
1:A:123:ILE:HD12	1:A:132:ILE:HD11	1.91	0.53
1:B:219:GLN:NE2	1:B:224:GLU:CD	2.62	0.53
1:A:45:GLY:HA3	1:A:51:LYS:NZ	2.23	0.53
1:B:149:GLY:O	1:B:151:ILE:N	2.42	0.53
1:B:194:LEU:O	1:B:198:ARG:HG3	2.08	0.53
1:A:276:GLU:HG3	1:A:277:ASP:H	1.73	0.52
1:B:15:ILE:O	1:B:168:TYR:HE2	1.92	0.52
1:A:145:THR:CG2	1:A:147:ARG:H	2.21	0.52
1:A:227:THR:HG22	1:A:230:ARG:CG	2.30	0.52
1:B:145:THR:HG21	1:B:148:PRO:CA	2.40	0.52
1:A:70:SER:CB	1:A:72:PRO:HD2	2.35	0.52
1:A:286:GLU:O	1:A:290:ILE:HG13	2.09	0.52
1:B:210:LEU:CD1	1:B:240:LEU:HD11	2.24	0.52
1:B:281:LEU:O	1:B:286:GLU:HG3	2.09	0.52
1:A:15:ILE:HD11	1:A:179:ARG:HD3	1.92	0.52
1:A:110:LEU:O	1:A:114:MET:HG3	2.09	0.52
1:B:88:LEU:HD11	1:B:94:LEU:HB2	1.90	0.52
1:B:203:THR:CG2	1:B:205:ARG:HB3	2.40	0.52
1:B:64:VAL:HG23	1:B:65:ASN:N	2.24	0.52
1:B:228:ARG:HH11	1:B:228:ARG:CB	2.22	0.52
1:B:7:ARG:HH11	1:B:208:LYS:NZ	2.07	0.51
1:B:38:LEU:O	1:B:140:THR:HB	2.09	0.51
1:A:305:THR:CG2	1:A:308:ALA:N	2.71	0.51
1:B:136:LEU:HB3	1:B:137:PRO:HD2	1.92	0.51
1:A:195:GLU:O	1:A:199:ARG:HG2	2.10	0.51
1:B:117:PHE:HE2	1:B:139:PHE:H	1.57	0.51
1:B:209:ARG:HH11	1:B:212:ARG:NH2	2.08	0.51
1:B:245:LEU:N	1:B:245:LEU:HD12	2.25	0.51
1:A:181:ALA:O	1:A:184:LEU:N	2.31	0.51
1:B:251:GLU:O	1:B:255:VAL:HG23	2.10	0.51
1:A:11:LEU:O	1:A:21:LYS:HD2	2.11	0.51
1:A:241:ASP:OD2	1:A:245:LEU:HB2	2.11	0.51
1:B:75:GLU:HG3	1:B:76:LYS:H	1.76	0.51
1:B:114:MET:HE1	1:B:141:LEU:HD22	1.93	0.51
1:B:15:ILE:HD11	1:B:179:ARG:HD3	1.91	0.51
1:B:145:THR:HG22	1:B:148:PRO:N	2.26	0.51
1:B:147:ARG:O	1:B:147:ARG:HG2	2.10	0.51
1:B:38:LEU:N	1:B:140:THR:HG21	2.26	0.51
1:B:120:ASP:OD2	1:B:133:ARG:NE	2.31	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:248:ARG:HH21	1:B:276:GLU:HB2	1.75	0.50
1:A:245:LEU:HD21	1:A:294:LEU:HD13	1.92	0.50
1:B:95:PHE:CE1	1:B:97:ASP:HB2	2.46	0.50
1:A:51:LYS:HD2	1:A:144:ALA:CB	2.42	0.50
1:A:194:LEU:O	1:A:198:ARG:HG3	2.11	0.50
1:A:253:LEU:HB2	1:A:312:LEU:HD11	1.92	0.50
1:A:41:LEU:HD11	1:A:43:LEU:HD23	1.94	0.50
1:A:122:VAL:O	1:B:123:ILE:HD13	2.12	0.50
1:B:70:SER:HB3	1:B:72:PRO:HD2	1.94	0.50
1:A:117:PHE:CE2	1:A:138:ARG:HA	2.46	0.50
1:A:317:PRO:O	1:A:318:VAL:O	2.30	0.50
1:B:99:ILE:HG12	1:B:99:ILE:O	2.11	0.50
1:A:277:ASP:HB3	1:A:280:THR:OG1	2.12	0.49
1:B:147:ARG:O	1:B:151:ILE:CG2	2.60	0.49
1:A:177:VAL:O	1:A:181:ALA:HB2	2.12	0.49
1:A:280:THR:O	1:A:284:VAL:HG23	2.12	0.49
1:B:245:LEU:HD12	1:B:245:LEU:H	1.77	0.49
1:B:261:GLY:O	1:B:263:GLY:N	2.39	0.49
1:B:298:THR:HB	1:B:299:PRO:HD2	1.94	0.49
1:A:117:PHE:CD2	1:A:138:ARG:HA	2.48	0.49
1:B:228:ARG:CB	1:B:228:ARG:NH1	2.75	0.49
1:A:31:ALA:O	1:A:35:LYS:N	2.46	0.49
1:A:57:VAL:O	1:A:60:HIS:N	2.46	0.49
1:B:122:VAL:HG13	1:B:122:VAL:O	2.12	0.49
1:B:266:GLY:O	1:B:268:ALA:N	2.45	0.49
1:A:34:ARG:CG	1:A:34:ARG:HH11	2.25	0.49
1:A:40:HIS:O	1:A:159:PHE:HD2	1.96	0.49
1:A:245:LEU:N	1:A:245:LEU:HD12	2.27	0.49
1:B:27:TYR:CE2	1:B:161:ILE:HD12	2.47	0.48
1:B:7:ARG:CB	1:B:8:PRO:CD	2.85	0.48
1:A:13:GLU:O	1:A:15:ILE:HD12	2.14	0.48
1:A:182:ARG:HA	1:A:186:VAL:O	2.13	0.48
1:A:315:PRO:O	1:A:316:PRO:C	2.49	0.48
1:B:241:ASP:N	1:B:250:ARG:HH12	2.12	0.48
1:A:147:ARG:O	1:A:149:GLY:N	2.46	0.48
1:A:199:ARG:HG2	1:A:199:ARG:NH1	2.27	0.48
1:A:227:THR:H	1:A:230:ARG:HG3	1.78	0.48
1:A:15:ILE:HD11	1:A:179:ARG:CD	2.44	0.48
1:A:81:ALA:HA	1:A:119:MET:HE1	1.96	0.48
1:A:199:ARG:HH11	1:A:199:ARG:CG	2.24	0.48
1:B:13:GLU:O	1:B:15:ILE:HD12	2.14	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:188:ILE:HG13	1:A:226:ILE:HB	1.95	0.48
1:B:15:ILE:HD12	1:B:15:ILE:N	2.29	0.48
1:B:35:LYS:C	1:B:37:PRO:CD	2.82	0.48
1:A:176:GLY:HA3	1:A:204:MET:CE	2.43	0.48
1:B:65:ASN:HB2	1:B:92:ASP:OD1	2.14	0.48
1:B:216:ASP:O	1:B:216:ASP:CG	2.52	0.48
1:A:69:THR:CG2	1:A:96:ILE:HD13	2.44	0.48
1:B:147:ARG:C	1:B:149:GLY:H	2.17	0.48
1:B:110:LEU:HD11	1:B:141:LEU:CD1	2.44	0.48
1:A:82:ALA:HA	1:B:132:ILE:HG22	1.95	0.48
1:A:220:VAL:HG13	1:A:221:ALA:N	2.28	0.48
1:B:177:VAL:O	1:B:181:ALA:HB2	2.14	0.48
1:B:219:GLN:HE21	1:B:224:GLU:CD	2.17	0.48
1:A:46:PRO:HG2	1:A:49:LEU:HD23	1.96	0.47
1:B:280:THR:O	1:B:284:VAL:HG23	2.14	0.47
1:A:148:PRO:O	1:A:149:GLY:C	2.51	0.47
1:B:270:LEU:HD23	1:B:281:LEU:HD21	1.95	0.47
1:A:188:ILE:CG1	1:A:192:ALA:HB3	2.43	0.47
1:B:27:TYR:CD2	1:B:161:ILE:HD12	2.49	0.47
1:B:66:LEU:HD12	1:B:93:ILE:O	2.15	0.47
1:A:188:ILE:HD11	1:A:192:ALA:HB1	1.97	0.47
1:B:132:ILE:HD12	1:B:132:ILE:C	2.35	0.47
1:B:123:ILE:HD12	1:B:124:GLY:N	2.29	0.47
1:B:200:SER:OG	1:B:206:VAL:HG12	2.15	0.47
1:B:261:GLY:C	1:B:263:GLY:H	2.17	0.47
1:A:35:LYS:HB3	1:A:37:PRO:CG	2.45	0.47
1:A:228:ARG:HH11	1:A:228:ARG:CB	2.27	0.47
1:B:223:GLU:OE1	1:B:223:GLU:N	2.41	0.47
1:A:117:PHE:HE2	1:A:139:PHE:H	1.63	0.47
1:B:305:THR:HG23	1:B:308:ALA:N	2.28	0.47
1:A:119:MET:CE	1:A:136:LEU:HD11	2.44	0.47
1:A:153:ALA:CB	1:A:154:PRO:HD2	2.43	0.47
1:B:145:THR:CG2	1:B:148:PRO:N	2.78	0.46
1:A:181:ALA:O	1:A:184:LEU:HB3	2.15	0.46
1:A:211:PHE:CD2	1:A:215:ARG:NH1	2.83	0.46
1:A:38:LEU:HD23	1:A:38:LEU:C	2.36	0.46
1:B:28:LEU:O	1:B:29:GLU:C	2.53	0.46
1:B:90:GLU:HA	1:B:137:PRO:HB2	1.97	0.46
1:B:158:ARG:HG3	1:B:158:ARG:NH1	2.30	0.46
1:B:251:GLU:O	1:B:254:GLU:HB3	2.15	0.46
1:A:209:ARG:HH11	1:A:212:ARG:NH2	2.12	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:9:LYS:HD2	1:B:9:LYS:N	2.31	0.46
1:B:178:MET:SD	1:B:190:GLU:HA	2.55	0.46
1:B:188:ILE:HD12	1:B:188:ILE:N	2.31	0.46
1:A:248:ARG:HH21	1:A:276:GLU:HB2	1.80	0.46
1:B:23:LYS:O	1:B:27:TYR:CD1	2.69	0.46
1:B:42:LEU:HD21	1:B:44:PHE:CE2	2.50	0.46
1:B:214:VAL:C	1:B:216:ASP:N	2.69	0.46
1:A:273:ALA:C	1:A:275:SER:H	2.19	0.46
1:A:298:THR:HB	1:A:299:PRO:HD2	1.98	0.46
1:B:201:ARG:C	1:B:203:THR:N	2.68	0.46
1:A:279:GLY:O	1:A:283:GLU:HB2	2.15	0.45
1:B:41:LEU:CD1	1:B:161:ILE:HB	2.45	0.45
1:A:77:PRO:O	1:A:78:GLY:C	2.53	0.45
1:A:110:LEU:HD21	1:A:141:LEU:HD11	1.99	0.45
1:A:228:ARG:CB	1:A:228:ARG:NH1	2.80	0.45
1:A:256:LEU:HD13	1:A:304:PRO:HB3	1.98	0.45
1:B:114:MET:CE	1:B:141:LEU:HD22	2.47	0.45
1:B:252:ILE:HG12	1:B:274:LEU:HD21	1.99	0.45
1:A:52:THR:O	1:A:55:ALA:HB3	2.16	0.45
1:B:35:LYS:C	1:B:37:PRO:HD3	2.36	0.45
1:B:107:GLU:HG2	1:B:111:TYR:CE1	2.40	0.45
1:B:116:ASP:O	1:B:118:VAL:HG23	2.16	0.45
1:B:181:ALA:O	1:B:184:LEU:HB3	2.16	0.45
1:B:225:VAL:HG22	1:B:226:ILE:N	2.31	0.45
1:B:241:ASP:O	1:B:243:LEU:N	2.49	0.45
1:A:241:ASP:C	1:A:243:LEU:N	2.69	0.45
1:A:31:ALA:HA	1:A:34:ARG:HB2	1.99	0.45
1:A:203:THR:HG22	1:A:205:ARG:N	2.32	0.45
1:B:188:ILE:CG2	1:B:189:THR:N	2.80	0.45
1:A:210:LEU:CD1	1:A:240:LEU:HD11	2.31	0.45
1:B:90:GLU:HG2	1:B:138:ARG:N	2.32	0.45
1:B:176:GLY:HA3	1:B:204:MET:CE	2.47	0.45
1:B:188:ILE:HG22	1:B:189:THR:O	2.17	0.45
1:B:273:ALA:C	1:B:275:SER:H	2.20	0.45
1:A:213:ARG:O	1:A:238:LEU:HD11	2.16	0.44
1:B:18:GLU:O	1:B:19:ARG:C	2.54	0.44
1:B:51:LYS:HD2	1:B:144:ALA:CB	2.44	0.44
1:B:64:VAL:HG23	1:B:65:ASN:H	1.82	0.44
1:B:245:LEU:HD21	1:B:294:LEU:HD13	1.99	0.44
1:B:266:GLY:C	1:B:268:ALA:N	2.70	0.44
1:B:241:ASP:C	1:B:243:LEU:N	2.68	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:34:ARG:CG	1:A:34:ARG:NH1	2.79	0.44
1:A:194:LEU:HD21	1:A:198:ARG:NE	2.32	0.44
1:A:201:ARG:C	1:A:203:THR:N	2.70	0.44
1:B:241:ASP:H	1:B:250:ARG:HH12	1.65	0.44
1:A:270:LEU:O	1:A:274:LEU:CB	2.66	0.44
1:B:262:GLY:O	1:B:263:GLY:C	2.56	0.44
1:A:210:LEU:O	1:A:213:ARG:N	2.42	0.44
1:A:243:LEU:HB3	1:A:245:LEU:HD13	2.00	0.44
1:B:79:ASP:O	1:B:83:ILE:HG13	2.18	0.44
1:B:210:LEU:HD12	1:B:213:ARG:HH21	1.83	0.44
1:B:267:LEU:CD1	1:B:281:LEU:HD23	2.48	0.44
1:B:88:LEU:O	1:B:137:PRO:HG3	2.17	0.44
1:B:107:GLU:O	1:B:110:LEU:N	2.51	0.44
1:A:201:ARG:HD3	1:A:288:TYR:CD1	2.53	0.44
1:B:214:VAL:O	1:B:216:ASP:N	2.51	0.44
1:A:10:THR:HG22	1:A:13:GLU:HG3	1.98	0.44
1:B:264:PRO:CA	1:B:303:VAL:HG12	2.47	0.44
1:A:14:TYR:CE2	3:A:501:ADE:N6	2.86	0.43
1:A:158:ARG:HG3	1:A:158:ARG:HH11	1.83	0.43
1:B:186:VAL:HG22	1:B:188:ILE:HD11	1.99	0.43
1:B:200:SER:C	1:B:201:ARG:HG3	2.38	0.43
1:A:29:GLU:OE2	1:A:32:LYS:HE2	2.17	0.43
1:A:71:GLY:H	1:A:72:PRO:CD	2.31	0.43
1:A:263:GLY:O	1:A:264:PRO:C	2.56	0.43
1:B:203:THR:HG22	1:B:205:ARG:N	2.32	0.43
1:A:23:LYS:O	1:A:27:TYR:HD1	2.00	0.43
1:A:218:ALA:C	1:A:220:VAL:H	2.22	0.43
1:B:149:GLY:O	1:B:150:LEU:C	2.56	0.43
1:A:174:ALA:O	1:A:177:VAL:N	2.52	0.43
1:A:233:GLU:O	1:A:236:ALA:HB3	2.18	0.43
1:B:173:LEU:HD22	1:B:207:ALA:CB	2.44	0.43
1:A:219:GLN:HA	1:A:222:GLY:O	2.17	0.43
1:A:286:GLU:HB2	1:A:287:PRO:HD3	2.00	0.43
1:A:6:LEU:HD23	1:A:7:ARG:N	2.33	0.43
1:A:241:ASP:OD1	1:A:245:LEU:N	2.52	0.43
1:B:149:GLY:C	1:B:151:ILE:H	2.22	0.43
1:B:176:GLY:HA3	1:B:204:MET:HE1	2.00	0.43
1:B:227:THR:H	1:B:230:ARG:HG3	1.84	0.43
1:B:255:VAL:HG21	1:B:274:LEU:HD13	2.00	0.43
1:A:305:THR:HG22	1:A:308:ALA:HB2	2.00	0.43
1:B:191:GLU:CD	1:B:191:GLU:H	2.20	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:256:LEU:HD13	1:B:304:PRO:HB3	2.01	0.43
1:B:270:LEU:O	1:B:274:LEU:CB	2.67	0.43
1:B:53:THR:O	1:B:57:VAL:HG23	2.19	0.43
1:B:96:ILE:O	1:B:99:ILE:HB	2.19	0.43
1:A:103:SER:HB2	1:A:106:ALA:HB2	2.00	0.43
1:A:125:GLN:OE1	1:B:125:GLN:HA	2.18	0.43
1:A:219:GLN:O	1:A:219:GLN:CG	2.67	0.43
1:A:293:GLY:O	1:A:305:THR:CG2	2.58	0.43
1:B:30:ALA:O	1:B:34:ARG:CD	2.55	0.43
1:B:36:GLU:N	1:B:37:PRO:CD	2.82	0.43
1:B:187:ARG:HG2	1:B:187:ARG:HH11	1.84	0.43
1:A:45:GLY:HA3	1:A:51:LYS:HZ1	1.83	0.43
1:A:95:PHE:CE1	1:A:97:ASP:HB2	2.54	0.43
1:B:305:THR:HG21	1:B:307:LEU:HB3	2.00	0.43
1:A:10:THR:HG22	1:A:13:GLU:CG	2.49	0.42
1:A:49:LEU:HD11	1:A:168:TYR:CE1	2.53	0.42
1:A:219:GLN:CD	1:A:223:GLU:O	2.58	0.42
1:B:45:GLY:HA3	1:B:51:LYS:NZ	2.34	0.42
1:B:263:GLY:HA2	1:B:264:PRO:HD2	1.81	0.42
1:B:10:THR:HG22	1:B:13:GLU:OE1	2.19	0.42
1:B:66:LEU:HD11	1:B:95:PHE:HB2	1.99	0.42
1:A:57:VAL:O	1:A:59:ALA:N	2.53	0.42
1:B:77:PRO:O	1:B:78:GLY:C	2.57	0.42
1:B:110:LEU:O	1:B:114:MET:HG3	2.18	0.42
1:A:30:ALA:O	1:A:34:ARG:HG3	2.20	0.42
1:A:107:GLU:O	1:A:110:LEU:N	2.52	0.42
1:A:211:PHE:CE2	1:A:215:ARG:HD3	2.55	0.42
1:B:117:PHE:HE2	1:B:139:PHE:N	2.17	0.42
1:B:243:LEU:HD12	1:B:243:LEU:HA	1.87	0.42
1:B:292:GLN:NE2	1:B:292:GLN:HA	2.35	0.42
1:A:57:VAL:O	1:A:58:ILE:C	2.56	0.42
1:A:245:LEU:HD21	1:A:294:LEU:CD1	2.49	0.42
1:B:148:PRO:C	1:B:150:LEU:N	2.69	0.42
1:B:203:THR:CG2	1:B:206:VAL:H	2.29	0.42
1:B:240:LEU:CD2	1:B:246:GLU:OE1	2.67	0.42
1:A:241:ASP:N	1:A:250:ARG:HH12	2.17	0.42
1:B:7:ARG:NH2	1:B:179:ARG:HH12	2.17	0.42
1:B:77:PRO:O	1:B:80:LEU:N	2.53	0.42
1:B:205:ARG:O	1:B:209:ARG:HB2	2.19	0.42
1:B:216:ASP:O	1:B:216:ASP:OD2	2.38	0.42
1:B:294:LEU:O	1:B:305:THR:HG22	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:LEU:C	1:A:212:ARG:N	2.73	0.42
1:A:234:ALA:O	1:A:235:LEU:C	2.58	0.42
1:A:241:ASP:CG	1:A:250:ARG:HH11	2.24	0.42
1:A:243:LEU:HD12	1:A:243:LEU:HA	1.83	0.42
1:A:253:LEU:CB	1:A:312:LEU:HD11	2.50	0.42
1:A:281:LEU:O	1:A:286:GLU:HG3	2.20	0.42
1:B:41:LEU:HD12	1:B:161:ILE:HB	2.02	0.41
1:B:153:ALA:CB	1:B:154:PRO:HD2	2.43	0.41
1:B:194:LEU:CD2	1:B:198:ARG:HE	2.33	0.41
1:B:211:PHE:CD2	1:B:215:ARG:NH1	2.88	0.41
1:A:132:ILE:CG2	1:A:133:ARG:N	2.83	0.41
1:A:177:VAL:O	1:A:181:ALA:CB	2.68	0.41
1:A:227:THR:H	1:A:230:ARG:CG	2.33	0.41
1:A:286:GLU:O	1:A:289:LEU:HB2	2.20	0.41
1:A:57:VAL:C	1:A:59:ALA:N	2.73	0.41
1:A:28:LEU:O	1:A:29:GLU:C	2.59	0.41
1:A:35:LYS:CA	1:A:37:PRO:HD2	2.49	0.41
1:A:154:PRO:O	1:A:157:SER:OG	2.34	0.41
1:B:17:GLN:OE1	1:B:166:GLU:N	2.53	0.41
1:B:111:TYR:CB	1:B:112:PRO:HD3	2.25	0.41
1:B:305:THR:CG2	1:B:308:ALA:H	2.32	0.41
1:A:176:GLY:HA3	1:A:204:MET:HE1	2.01	0.41
1:A:255:VAL:HG13	1:A:259:ARG:HB2	2.03	0.41
1:B:169:THR:HG23	1:B:172:GLU:OE1	2.20	0.41
1:B:213:ARG:O	1:B:238:LEU:HD11	2.20	0.41
1:A:10:THR:HG22	1:A:13:GLU:OE1	2.21	0.41
1:A:194:LEU:CD2	1:A:198:ARG:HE	2.33	0.41
1:A:203:THR:CG2	1:A:206:VAL:H	2.32	0.41
1:A:305:THR:HG21	1:A:307:LEU:HB3	2.03	0.41
1:B:145:THR:HG22	1:B:147:ARG:N	2.36	0.41
1:B:177:VAL:O	1:B:181:ALA:CB	2.69	0.41
1:A:145:THR:HG22	1:A:146:THR:N	2.35	0.41
1:A:200:SER:OG	1:A:206:VAL:HG12	2.21	0.41
1:A:259:ARG:HG3	1:A:259:ARG:HH11	1.86	0.41
1:B:110:LEU:HD21	1:B:141:LEU:HD11	2.02	0.41
1:B:147:ARG:CG	1:B:147:ARG:O	2.67	0.41
1:B:255:VAL:HG21	1:B:274:LEU:CD1	2.51	0.41
1:A:103:SER:HB2	1:A:106:ALA:HB3	2.03	0.41
1:A:109:HIS:O	1:A:112:PRO:HD2	2.21	0.41
1:A:194:LEU:HD21	1:A:198:ARG:HE	1.86	0.41
1:A:223:GLU:H	1:A:223:GLU:HG3	1.69	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:11:LEU:O	1:B:21:LYS:HD2	2.21	0.40
1:B:150:LEU:HD23	1:B:150:LEU:HA	1.87	0.40
1:A:110:LEU:HD11	1:A:141:LEU:CD1	2.51	0.40
1:A:211:PHE:CD2	1:A:215:ARG:HD3	2.56	0.40
1:A:311:HIS:C	1:A:313:GLY:N	2.75	0.40
1:A:292:GLN:NE2	1:A:292:GLN:HA	2.36	0.40
1:B:210:LEU:C	1:B:212:ARG:N	2.74	0.40
1:A:14:TYR:CE1	1:A:54:LEU:HB2	2.56	0.40
1:B:14:TYR:HD1	1:B:57:VAL:HG21	1.87	0.40
1:B:71:GLY:N	1:B:72:PRO:CD	2.84	0.40
1:B:94:LEU:CD1	1:B:96:ILE:HD11	2.51	0.40
1:B:101:ARG:HG2	1:B:101:ARG:NH1	2.34	0.40
1:B:153:ALA:HB3	1:B:154:PRO:CD	2.43	0.40
1:B:15:ILE:HD11	1:B:179:ARG:CD	2.51	0.40
1:B:314:TYR:HB3	1:B:315:PRO:CD	2.51	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	312/324 (96%)	239 (77%)	56 (18%)	17 (5%)	<b>2</b> <b>14</b>
1	B	312/324 (96%)	230 (74%)	59 (19%)	23 (7%)	<b>1</b> <b>7</b>
All	All	624/648 (96%)	469 (75%)	115 (18%)	40 (6%)	<b>1</b> <b>10</b>

All (40) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	153	ALA
1	A	268	ALA
1	B	36	GLU

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Mol	Chain	Res	Type
1	B	37	PRO
1	B	153	ALA
1	B	264	PRO
1	B	268	ALA
1	A	149	GLY
1	A	150	LEU
1	A	151	ILE
1	A	200	SER
1	B	125	GLN
1	B	149	GLY
1	B	150	LEU
1	B	200	SER
1	B	242	GLU
1	B	265	VAL
1	B	267	LEU
1	A	242	GLU
1	A	287	PRO
1	B	39	GLU
1	B	50	GLY
1	B	215	ARG
1	B	287	PRO
1	A	99	ILE
1	A	181	ALA
1	B	181	ALA
1	B	316	PRO
1	A	219	GLN
1	A	272	THR
1	A	312	LEU
1	B	7	ARG
1	B	220	VAL
1	B	272	THR
1	A	50	GLY
1	B	28	LEU
1	A	37	PRO
1	A	264	PRO
1	B	47	PRO
1	A	148	PRO

### 5.3.2 Protein sidechains [i](#)

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



resolution.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	255/264 (97%)	232 (91%)	23 (9%)	9	34
1	B	255/264 (97%)	232 (91%)	23 (9%)	9	34
All	All	510/528 (97%)	464 (91%)	46 (9%)	9	34

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	ASP
1	A	34	ARG
1	A	35	LYS
1	A	49	LEU
1	A	76	LYS
1	A	94	LEU
1	A	119	MET
1	A	131	THR
1	A	134	LEU
1	A	147	ARG
1	A	155	LEU
1	A	157	SER
1	A	164	HIS
1	A	166	GLU
1	A	182	ARG
1	A	187	ARG
1	A	209	ARG
1	A	223	GLU
1	A	242	GLU
1	A	247	LYS
1	A	256	LEU
1	A	287	PRO
1	A	304	PRO
1	B	7	ARG
1	B	12	ASP
1	B	17	GLN
1	B	34	ARG
1	B	35	LYS
1	B	37	PRO
1	B	38	LEU
1	B	64	VAL

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Mol	Chain	Res	Type
1	B	90	GLU
1	B	94	LEU
1	B	123	ILE
1	B	134	LEU
1	B	146	THR
1	B	147	ARG
1	B	157	SER
1	B	164	HIS
1	B	182	ARG
1	B	209	ARG
1	B	219	GLN
1	B	220	VAL
1	B	242	GLU
1	B	247	LYS
1	B	256	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	22	GLN
1	A	105	GLN
1	A	109	HIS
1	A	175	GLN
1	A	292	GLN
1	B	22	GLN
1	B	105	GLN
1	B	109	HIS
1	B	219	GLN
1	B	292	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](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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
3	ADE	B	502	-	8,11,11	1.90	3 (37%)	6,15,15	1.32	1 (16%)
3	ADE	A	501	-	8,11,11	1.81	3 (37%)	6,15,15	1.28	1 (16%)

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	ADE	B	502	-	-	-	0/2/2/2
3	ADE	A	501	-	-	-	0/2/2/2

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	501	ADE	C2-N3	3.71	1.37	1.32
3	B	502	ADE	C2-N3	3.68	1.37	1.32
3	B	502	ADE	C4-N9	2.40	1.39	1.34
3	B	502	ADE	C4-N3	2.33	1.40	1.37
3	A	501	ADE	C4-N9	2.19	1.38	1.34
3	A	501	ADE	C4-N3	2.04	1.40	1.37

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	501	ADE	N3-C2-N1	-2.48	125.31	128.67

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	502	ADE	N3-C2-N1	-2.39	125.42	128.67

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	ADE	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [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	314/324 (96%)	-0.47	7 (2%) 62 48	49, 90, 164, 200	1 (0%)
1	B	314/324 (96%)	-0.36	9 (2%) 51 36	49, 101, 179, 200	0
All	All	628/648 (96%)	-0.41	16 (2%) 57 43	49, 97, 173, 200	1 (0%)

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	222	GLY	7.5
1	B	218	ALA	4.7
1	B	223	GLU	4.7
1	A	125	GLN	4.4
1	A	221	ALA	4.3
1	A	222	GLY	3.8
1	B	182	ARG	3.4
1	A	5	ALA	3.2
1	B	221	ALA	3.2
1	B	5	ALA	2.9
1	B	219	GLN	2.8
1	A	223	GLU	2.7
1	B	220	VAL	2.5
1	A	220	VAL	2.5
1	A	127	PRO	2.2
1	B	283	GLU	2.1

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

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

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	ADE	B	502	10/10	0.55	0.47	175,175,175,175	0
3	ADE	A	501	10/10	0.61	0.41	177,177,177,177	0
2	MG	A	401	1/1	0.70	0.12	79,79,79,79	0
2	MG	B	402	1/1	0.96	0.41	93,93,93,93	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.