



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 11:19 AM GMT

PDB ID : 3OPO  
Title : Crystal structure of the membrane fusion protein CusB from Escherichia coli  
Authors : Su, C.-C.  
Deposited on : 2010-09-01  
Resolution : 3.85 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

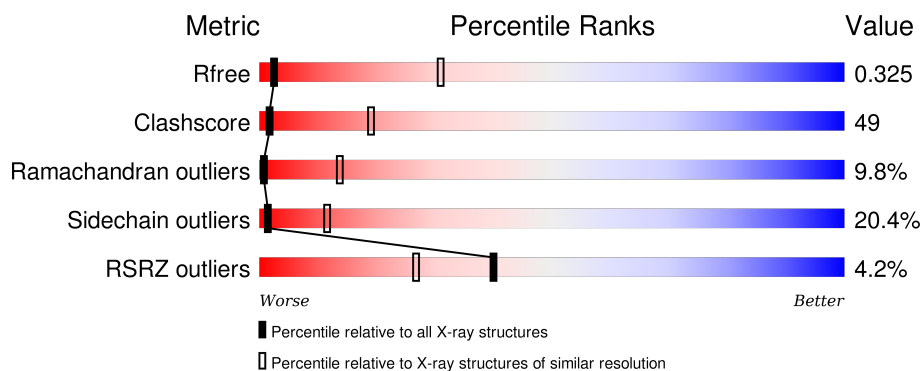
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

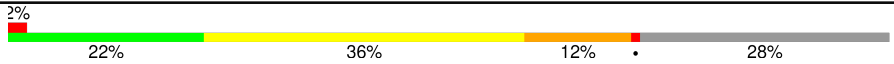
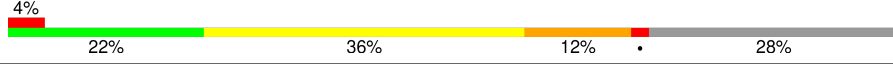
The reported resolution of this entry is 3.85 Å.

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))
$R_{free}$	91344	1334 (4.18-3.50)
Clashscore	102246	1036 (4.16-3.52)
Ramachandran outliers	100387	1415 (4.18-3.50)
Sidechain outliers	100360	1410 (4.18-3.50)
RSRZ outliers	91569	1342 (4.18-3.50)

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

Mol	Chain	Length	Quality of chain
1	A	413	
1	B	413	

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
2	AG	A	414	-	-	-	X

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4543 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 Cation efflux system protein cusB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	296	Total	C	N	O	S	0	0	0
			2267	1444	391	427	5			
1	B	297	Total	C	N	O	S	0	0	0
			2274	1448	392	429	5			

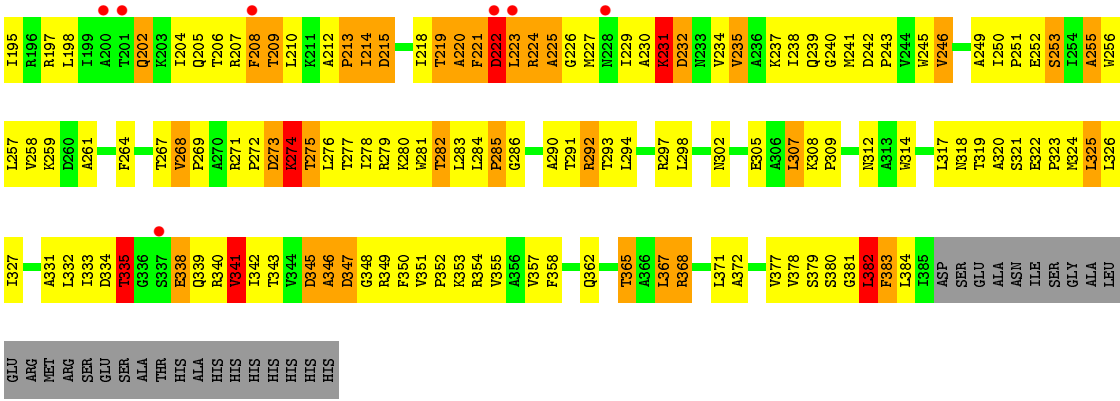
There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	408	HIS	-	EXPRESSION TAG	UNP P77239
A	409	HIS	-	EXPRESSION TAG	UNP P77239
A	410	HIS	-	EXPRESSION TAG	UNP P77239
A	411	HIS	-	EXPRESSION TAG	UNP P77239
A	412	HIS	-	EXPRESSION TAG	UNP P77239
A	413	HIS	-	EXPRESSION TAG	UNP P77239
B	408	HIS	-	EXPRESSION TAG	UNP P77239
B	409	HIS	-	EXPRESSION TAG	UNP P77239
B	410	HIS	-	EXPRESSION TAG	UNP P77239
B	411	HIS	-	EXPRESSION TAG	UNP P77239
B	412	HIS	-	EXPRESSION TAG	UNP P77239
B	413	HIS	-	EXPRESSION TAG	UNP P77239

- Molecule 2 is SILVER ION (three-letter code: AG) (formula: Ag).

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





## 4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	84.80 Å   114.68 Å   259.17 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	39.31 – 3.85 39.31 – 3.85	Depositor EDS
% Data completeness (in resolution range)	90.9 (39.31-3.85) 98.8 (39.31-3.85)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.88 (at 3.87 Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.4_486)	Depositor
R, $R_{free}$	0.295   ,   0.340 0.275   ,   0.325	Depositor DCC
$R_{free}$ test set	585 reflections (4.79%)	DCC
Wilson B-factor (Å <sup>2</sup> )	159.3	Xtriage
Anisotropy	0.686	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 238.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	0 of 12235 reflections	Xtriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	4543	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	222.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.04% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: AG

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	0.32	1/2306 (0.0%)	0.53	0/3142
1	B	0.27	0/2313	0.54	0/3152
All	All	0.30	1/4619 (0.0%)	0.53	0/6294

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	322	GLU	CB-CG	5.26	1.62	1.52

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	2267	0	2336	233	0
1	B	2274	0	2343	227	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
All	All	4543	0	4679	449	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 49.



All (449) 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:332:LEU:HA	1:A:341:VAL:HG11	1.32	1.08
1:A:117:ASN:HD21	1:A:243:PRO:HG2	1.21	1.01
1:A:122:ALA:HB3	1:A:214:ILE:HD12	1.49	0.94
1:A:106:PHE:CD2	1:B:253:SER:HA	2.06	0.89
1:A:249:ALA:HB1	1:A:293:THR:HG21	1.52	0.89
1:B:340:ARG:HA	1:B:355:VAL:HG22	1.54	0.88
1:A:343:THR:HB	1:A:351:VAL:HG13	1.56	0.87
1:A:255:ALA:O	1:A:258:VAL:HG12	1.73	0.87
1:A:150:LEU:HD11	1:A:212:ALA:HB2	1.56	0.87
1:A:340:ARG:HB2	1:A:353:LYS:O	1.75	0.86
1:A:94:VAL:HG13	1:A:381:GLY:HA2	1.56	0.85
1:A:154:THR:HG22	1:A:207:ARG:HB3	1.58	0.85
1:B:340:ARG:HB2	1:B:353:LYS:O	1.77	0.84
1:B:127:ARG:HD2	1:B:189:GLY:HA3	1.59	0.84
1:B:94:VAL:HG13	1:B:381:GLY:HA2	1.58	0.84
1:B:89:THR:HA	1:B:383:PHE:HE1	1.41	0.83
1:B:246:VAL:HG13	1:B:298:LEU:HB2	1.60	0.83
1:B:94:VAL:HG12	1:B:95:LYS:H	1.44	0.82
1:A:220:ALA:O	1:A:221:PHE:HB3	1.77	0.82
1:A:253:SER:HA	1:B:106:PHE:CD2	2.15	0.82
1:B:174:THR:HG23	1:B:177:GLN:HG2	1.60	0.82
1:B:103:PRO:HB3	1:B:321:SER:O	1.80	0.81
1:A:103:PRO:HB3	1:A:321:SER:O	1.81	0.81
1:A:324:MET:O	1:A:326:LEU:HD23	1.81	0.81
1:B:154:THR:HG22	1:B:207:ARG:HB3	1.63	0.80
1:B:220:ALA:O	1:B:221:PHE:HB3	1.80	0.80
1:A:132:ILE:HG22	1:A:227:MET:H	1.45	0.80
1:A:94:VAL:HG12	1:A:95:LYS:H	1.48	0.79
1:B:117:ASN:HD21	1:B:243:PRO:HG2	1.46	0.79
1:B:319:THR:HG22	1:B:320:ALA:H	1.46	0.78
1:B:89:THR:HA	1:B:383:PHE:CE1	2.19	0.78
1:A:219:THR:HG21	1:A:239:GLN:HG2	1.66	0.77
1:A:117:ASN:ND2	1:A:243:PRO:HG2	1.99	0.77
1:B:114:VAL:HB	1:B:309:PRO:HA	1.66	0.76
1:B:132:ILE:HG22	1:B:227:MET:H	1.48	0.76
1:A:278:ILE:HD11	1:A:298:LEU:HD22	1.65	0.76
1:A:132:ILE:HG12	1:A:133:ASP:N	2.02	0.75
1:A:281:TRP:HB3	1:A:298:LEU:HD21	1.70	0.74
1:B:131:PHE:O	1:B:153:LEU:HB2	1.87	0.73
1:A:202:GLN:HA	1:A:202:GLN:HE21	1.53	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:245:TRP:HE1	1:A:299:GLU:HG2	1.54	0.73
1:B:343:THR:HB	1:B:351:VAL:HG13	1.69	0.73
1:A:132:ILE:HG12	1:A:133:ASP:H	1.53	0.72
1:B:202:GLN:HE21	1:B:202:GLN:HA	1.52	0.72
1:B:120:GLN:HG3	1:B:240:GLY:HA3	1.72	0.72
1:A:242:ASP:HB3	1:A:243:PRO:HD3	1.72	0.72
1:B:341:VAL:HG13	1:B:342:ILE:N	2.04	0.72
1:B:147:GLY:HA2	1:B:212:ALA:O	1.90	0.71
1:B:162:GLN:HE22	1:B:205:GLN:HB2	1.57	0.70
1:B:112:ALA:HB1	1:B:246:VAL:HG23	1.74	0.70
1:B:145:GLN:O	1:B:146:LYS:HB2	1.90	0.70
1:A:112:ALA:HB1	1:A:246:VAL:HG23	1.74	0.70
1:A:332:LEU:HA	1:A:341:VAL:CG1	2.15	0.70
1:A:321:SER:HA	1:B:256:TRP:CE2	2.27	0.70
1:A:250:ILE:O	1:A:293:THR:HA	1.90	0.70
1:B:132:ILE:HG23	1:B:226:GLY:HA2	1.73	0.69
1:A:158:TRP:HE1	1:A:190:MET:HG3	1.56	0.69
1:A:147:GLY:HA2	1:A:212:ALA:O	1.93	0.69
1:A:128:ALA:HA	1:A:231:LYS:HA	1.75	0.69
1:A:355:VAL:HG11	1:A:371:LEU:HG	1.76	0.68
1:B:255:ALA:O	1:B:258:VAL:HG12	1.93	0.68
1:B:152:ASP:HA	1:B:209:THR:HA	1.75	0.68
1:A:128:ALA:HB3	1:A:158:TRP:HZ3	1.57	0.68
1:B:229:ILE:HG22	1:B:230:ALA:H	1.60	0.67
1:A:218:ILE:H	1:A:218:ILE:HD12	1.61	0.66
1:A:278:ILE:HD11	1:A:298:LEU:CD2	2.24	0.66
1:B:381:GLY:O	1:B:382:LEU:HB3	1.94	0.66
1:B:324:MET:O	1:B:326:LEU:CD2	2.44	0.66
1:B:324:MET:O	1:B:326:LEU:HD22	1.96	0.66
1:B:126:ALA:O	1:B:232:ASP:HA	1.96	0.66
1:A:340:ARG:HA	1:A:355:VAL:HG22	1.77	0.66
1:A:97:ALA:O	1:A:376:LYS:HG3	1.96	0.66
1:A:229:ILE:HG22	1:A:230:ALA:H	1.60	0.66
1:B:280:LYS:HG2	1:B:281:TRP:N	2.11	0.66
1:B:132:ILE:HG12	1:B:133:ASP:N	2.11	0.65
1:A:94:VAL:HG12	1:A:95:LYS:N	2.09	0.65
1:A:190:MET:SD	1:A:195:ILE:HG12	2.36	0.65
1:B:249:ALA:HB1	1:B:293:THR:HG21	1.78	0.65
1:B:278:ILE:HD11	1:B:298:LEU:HD13	1.78	0.64
1:A:357:VAL:HG23	1:B:285:PRO:HG2	1.78	0.64
1:A:368:ARG:HD3	1:A:368:ARG:O	1.98	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:250:ILE:O	1:B:293:THR:HA	1.97	0.64
1:A:145:GLN:O	1:A:146:LYS:HB2	1.96	0.64
1:B:327:ILE:HG13	1:B:365:THR:HG23	1.80	0.64
1:A:159:VAL:HA	1:A:162:GLN:CG	2.29	0.63
1:B:190:MET:SD	1:B:195:ILE:HG12	2.39	0.63
1:A:254:ILE:O	1:A:254:ILE:HG22	1.98	0.63
1:B:355:VAL:HG11	1:B:371:LEU:HG	1.81	0.63
1:B:156:PRO:O	1:B:158:TRP:N	2.31	0.63
1:A:256:TRP:CE2	1:B:321:SER:HA	2.34	0.62
1:A:144:VAL:HG12	1:A:218:ILE:HD11	1.80	0.62
1:B:268:VAL:HG23	1:B:271:ARG:O	1.98	0.62
1:B:94:VAL:HG12	1:B:95:LYS:N	2.13	0.62
1:A:355:VAL:HG12	1:A:370:GLY:HA3	1.80	0.62
1:B:274:LYS:HD2	1:B:274:LYS:H	1.65	0.62
1:A:244:VAL:HG12	1:A:245:TRP:N	2.15	0.61
1:A:317:LEU:HD12	1:A:318:ASN:H	1.66	0.61
1:A:210:LEU:O	1:A:210:LEU:HD12	2.01	0.61
1:B:220:ALA:O	1:B:221:PHE:CB	2.48	0.61
1:A:156:PRO:O	1:A:158:TRP:N	2.34	0.60
1:A:244:VAL:HG12	1:A:245:TRP:H	1.66	0.60
1:A:178:THR:O	1:A:181:ILE:HG22	2.01	0.60
1:B:297:ARG:O	1:B:298:LEU:HD23	2.02	0.60
1:A:220:ALA:O	1:A:221:PHE:CB	2.50	0.60
1:B:150:LEU:HD11	1:B:212:ALA:HB2	1.83	0.59
1:B:128:ALA:HA	1:B:231:LYS:HA	1.83	0.59
1:B:136:TYR:N	1:B:136:TYR:HD2	2.00	0.59
1:A:269:PRO:HD2	1:A:312:ASN:O	2.01	0.59
1:B:164:GLU:O	1:B:167:LEU:HG	2.02	0.59
1:A:258:VAL:HA	1:A:263:GLN:HE22	1.68	0.59
1:B:252:GLU:HA	1:B:255:ALA:HB2	1.85	0.59
1:B:302:ASN:OD1	1:B:305:GLU:HA	2.02	0.59
1:A:153:LEU:O	1:A:153:LEU:HD13	2.02	0.59
1:B:219:THR:HG21	1:B:239:GLN:HG2	1.85	0.59
1:A:202:GLN:CA	1:A:202:GLN:HE21	2.15	0.59
1:B:202:GLN:HE21	1:B:202:GLN:CA	2.14	0.59
1:A:132:ILE:CG1	1:A:133:ASP:H	2.15	0.59
1:A:308:LYS:HB3	1:A:309:PRO:HD2	1.85	0.59
1:A:122:ALA:CB	1:A:214:ILE:HD12	2.30	0.58
1:B:142:ASP:HB2	1:B:218:ILE:HD13	1.85	0.58
1:A:128:ALA:HB3	1:A:158:TRP:CZ3	2.37	0.58
1:B:152:ASP:OD1	1:B:152:ASP:N	2.36	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:165:TYR:HE2	1:A:178:THR:HB	1.68	0.58
1:A:321:SER:HA	1:B:256:TRP:CZ2	2.39	0.58
1:B:291:THR:O	1:B:293:THR:N	2.37	0.58
1:B:214:ILE:HG12	1:B:215:ASP:O	2.04	0.57
1:B:124:VAL:HG11	1:B:210:LEU:HD13	1.87	0.57
1:A:291:THR:O	1:A:293:THR:N	2.37	0.57
1:B:126:ALA:HB3	1:B:231:LYS:O	2.04	0.57
1:B:136:TYR:CD2	1:B:136:TYR:N	2.71	0.57
1:A:132:ILE:HG23	1:A:225:ALA:O	2.05	0.57
1:B:174:THR:CG2	1:B:177:GLN:HG2	2.34	0.57
1:A:142:ASP:H	1:A:218:ILE:HD13	1.69	0.57
1:B:319:THR:HG22	1:B:320:ALA:N	2.19	0.57
1:A:162:GLN:HE22	1:A:205:GLN:HB2	1.68	0.57
1:B:122:ALA:HB3	1:B:214:ILE:HD12	1.85	0.57
1:B:267:THR:HG23	1:B:314:TRP:HB2	1.85	0.57
1:B:123:ILE:O	1:B:123:ILE:HD12	2.04	0.57
1:A:343:THR:OG1	1:A:353:LYS:HB2	2.05	0.57
1:A:256:TRP:CZ2	1:B:321:SER:HA	2.39	0.57
1:B:134:LYS:O	1:B:135:VAL:HB	2.05	0.56
1:A:355:VAL:CG1	1:A:371:LEU:HG	2.35	0.56
1:A:132:ILE:HD11	1:A:151:LEU:HD12	1.87	0.56
1:B:191:PRO:HB2	1:B:194:ASP:HB2	1.87	0.56
1:A:134:LYS:O	1:A:135:VAL:HB	2.05	0.56
1:B:383:PHE:CD1	1:B:384:LEU:N	2.74	0.56
1:B:339:GLN:HE22	1:B:357:VAL:HG22	1.69	0.56
1:B:132:ILE:CG2	1:B:227:MET:H	2.18	0.56
1:B:377:VAL:HG22	1:B:378:VAL:N	2.21	0.56
1:B:368:ARG:HH11	1:B:368:ARG:HA	1.71	0.56
1:A:117:ASN:N	1:A:117:ASN:OD1	2.38	0.56
1:A:367:LEU:HD22	1:A:367:LEU:H	1.71	0.56
1:B:117:ASN:ND2	1:B:120:GLN:HB2	2.21	0.56
1:B:334:ASP:HB2	1:B:338:GLU:O	2.06	0.56
1:A:334:ASP:HB2	1:A:338:GLU:O	2.06	0.55
1:A:229:ILE:HG22	1:A:230:ALA:N	2.22	0.55
1:A:165:TYR:CE2	1:A:178:THR:HB	2.42	0.55
1:B:331:ALA:O	1:B:341:VAL:HG21	2.06	0.55
1:A:214:ILE:HD11	1:A:238:ILE:HB	1.88	0.55
1:B:135:VAL:HG11	1:B:224:ARG:HB2	1.88	0.55
1:A:132:ILE:CD1	1:A:151:LEU:HD12	2.36	0.55
1:B:132:ILE:CG1	1:B:133:ASP:N	2.70	0.55
1:A:345:ASP:O	1:A:347:ASP:N	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:214:ILE:HG12	1:A:215:ASP:O	2.07	0.55
1:B:231:LYS:NZ	1:B:231:LYS:HB2	2.22	0.55
1:B:234:VAL:HG22	1:B:235:VAL:N	2.22	0.54
1:A:174:THR:CG2	1:A:177:GLN:HG2	2.37	0.54
1:B:146:LYS:CG	1:B:147:GLY:H	2.20	0.54
1:A:317:LEU:HD12	1:A:318:ASN:N	2.22	0.54
1:B:165:TYR:HB2	1:B:181:ILE:HG21	1.90	0.54
1:A:339:GLN:O	1:A:340:ARG:HB3	2.07	0.54
1:B:114:VAL:HG12	1:B:115:SER:H	1.72	0.54
1:A:331:ALA:O	1:A:341:VAL:HG11	2.08	0.54
1:A:244:VAL:HG21	1:A:307:LEU:HD11	1.89	0.54
1:B:343:THR:OG1	1:B:353:LYS:HB2	2.08	0.54
1:B:159:VAL:HA	1:B:162:GLN:HG2	1.90	0.53
1:A:381:GLY:O	1:A:382:LEU:HB3	2.07	0.53
1:A:359:GLN:HA	1:B:285:PRO:HB3	1.90	0.53
1:A:383:PHE:CG	1:A:384:LEU:N	2.75	0.53
1:A:319:THR:HG22	1:A:320:ALA:N	2.23	0.53
1:B:153:LEU:O	1:B:153:LEU:HD13	2.08	0.53
1:A:264:PHE:HE1	1:A:281:TRP:CD1	2.26	0.53
1:A:234:VAL:HG22	1:A:235:VAL:N	2.23	0.53
1:B:282:THR:HG23	1:B:297:ARG:HB3	1.91	0.53
1:B:132:ILE:HD11	1:B:135:VAL:CG2	2.39	0.53
1:B:135:VAL:HG21	1:B:224:ARG:HA	1.91	0.53
1:B:256:TRP:CD2	1:B:257:LEU:HD22	2.44	0.53
1:B:278:ILE:CD1	1:B:298:LEU:HD13	2.38	0.52
1:A:368:ARG:HD3	1:A:368:ARG:C	2.29	0.52
1:A:136:TYR:HB3	1:A:137:PRO:CD	2.40	0.52
1:A:117:ASN:HB3	1:A:245:TRP:CE2	2.44	0.52
1:A:324:MET:O	1:A:326:LEU:CD2	2.56	0.52
1:A:91:ASN:ND2	1:A:93:GLY:H	2.08	0.52
1:B:302:ASN:HD22	1:B:307:LEU:HG	1.74	0.52
1:B:165:TYR:CE2	1:B:178:THR:HB	2.45	0.52
1:A:237:LYS:HG2	1:A:238:ILE:N	2.25	0.52
1:B:95:LYS:HB3	1:B:380:SER:HB2	1.91	0.52
1:A:327:ILE:HD13	1:A:367:LEU:HD21	1.91	0.52
1:B:269:PRO:HD2	1:B:312:ASN:O	2.09	0.52
1:A:174:THR:HG23	1:A:177:GLN:HG2	1.91	0.52
1:B:229:ILE:HG22	1:B:230:ALA:N	2.24	0.52
1:B:136:TYR:HB3	1:B:137:PRO:CD	2.40	0.52
1:A:268:VAL:HG23	1:A:271:ARG:O	2.10	0.52
1:A:249:ALA:HB1	1:A:293:THR:CG2	2.34	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99:VAL:HG22	1:A:327:ILE:HG22	1.91	0.51
1:B:367:LEU:HD22	1:B:367:LEU:N	2.25	0.51
1:A:308:LYS:N	1:A:308:LYS:HD2	2.24	0.51
1:B:331:ALA:O	1:B:341:VAL:HG11	2.10	0.51
1:A:132:ILE:HG23	1:A:226:GLY:HA2	1.92	0.51
1:B:136:TYR:HB3	1:B:137:PRO:HD2	1.93	0.51
1:B:168:LEU:HD12	1:B:173:GLY:HA3	1.91	0.51
1:A:164:GLU:O	1:A:167:LEU:HG	2.10	0.51
1:A:132:ILE:CG1	1:A:133:ASP:N	2.70	0.51
1:A:126:ALA:O	1:A:232:ASP:HA	2.11	0.51
1:A:346:ALA:C	1:A:348:GLY:H	2.12	0.51
1:A:302:ASN:HD22	1:A:307:LEU:HG	1.74	0.51
1:A:231:LYS:HB2	1:A:231:LYS:NZ	2.26	0.51
1:B:284:LEU:O	1:B:286:GLY:N	2.41	0.51
1:B:132:ILE:HG23	1:B:225:ALA:O	2.11	0.51
1:B:122:ALA:CB	1:B:214:ILE:HD12	2.40	0.51
1:A:302:ASN:OD1	1:A:305:GLU:HA	2.10	0.50
1:B:152:ASP:CB	1:B:209:THR:HG23	2.41	0.50
1:A:136:TYR:HB3	1:A:137:PRO:HD2	1.92	0.50
1:B:355:VAL:CG1	1:B:371:LEU:HG	2.41	0.50
1:A:284:LEU:C	1:A:286:GLY:H	2.15	0.50
1:A:121:TYR:C	1:A:121:TYR:CD2	2.84	0.50
1:A:136:TYR:CD2	1:A:136:TYR:N	2.78	0.50
1:A:123:ILE:HD12	1:A:123:ILE:O	2.11	0.50
1:A:245:TRP:NE1	1:A:299:GLU:HG2	2.23	0.50
1:B:377:VAL:HG22	1:B:378:VAL:H	1.77	0.50
1:B:229:ILE:N	1:B:229:ILE:HD12	2.27	0.50
1:B:124:VAL:O	1:B:235:VAL:HG22	2.12	0.50
1:B:113:ASN:OD1	1:B:113:ASN:O	2.30	0.50
1:B:117:ASN:HB3	1:B:245:TRP:CE2	2.47	0.50
1:A:275:THR:HG21	1:A:277:THR:HG23	1.94	0.50
1:B:340:ARG:CB	1:B:354:ARG:HA	2.42	0.50
1:A:106:PHE:CE1	1:A:359:GLN:NE2	2.78	0.50
1:A:256:TRP:CD2	1:A:257:LEU:HD22	2.47	0.50
1:B:283:LEU:O	1:B:285:PRO:HD3	2.11	0.49
1:A:106:PHE:HE1	1:A:359:GLN:NE2	2.09	0.49
1:B:208:PHE:CD1	1:B:208:PHE:N	2.76	0.49
1:B:341:VAL:HG13	1:B:342:ILE:H	1.75	0.49
1:B:275:THR:HG22	1:B:276:LEU:H	1.76	0.49
1:A:152:ASP:N	1:A:152:ASP:OD1	2.45	0.49
1:B:144:VAL:HG12	1:B:218:ILE:HD11	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:266:LEU:HD22	1:A:315:LEU:HD13	1.94	0.49
1:A:340:ARG:CB	1:A:354:ARG:HA	2.43	0.49
1:B:116:TYR:HE2	1:B:241:MET:HG2	1.78	0.49
1:B:159:VAL:HA	1:B:162:GLN:CG	2.43	0.49
1:A:267:THR:HG23	1:A:314:TRP:HB2	1.95	0.49
1:A:345:ASP:OD2	1:A:349:ARG:HG3	2.12	0.48
1:A:215:ASP:OD1	1:A:215:ASP:N	2.41	0.48
1:A:153:LEU:HD22	1:A:154:THR:N	2.28	0.48
1:B:219:THR:O	1:B:237:LYS:HB3	2.13	0.48
1:B:155:ILE:HG13	1:B:208:PHE:HE1	1.78	0.48
1:B:168:LEU:HB3	1:B:178:THR:HG22	1.94	0.48
1:B:205:GLN:OE1	1:B:205:GLN:HA	2.12	0.48
1:B:145:GLN:O	1:B:146:LYS:CB	2.60	0.48
1:A:230:ALA:O	1:A:233:ASN:HB2	2.13	0.48
1:A:152:ASP:HA	1:A:209:THR:HA	1.95	0.48
1:A:377:VAL:HG22	1:A:378:VAL:N	2.27	0.48
1:A:122:ALA:HB3	1:A:214:ILE:CD1	2.32	0.48
1:B:115:SER:N	1:B:245:TRP:O	2.45	0.48
1:B:92:LEU:HA	1:B:94:VAL:HG23	1.94	0.48
1:B:148:THR:HB	1:B:149:PRO:HD2	1.95	0.48
1:A:331:ALA:HB2	1:A:379:SER:HB3	1.95	0.48
1:A:146:LYS:CG	1:A:147:GLY:H	2.25	0.48
1:A:115:SER:N	1:A:245:TRP:O	2.47	0.48
1:B:117:ASN:C	1:B:119:TYR:H	2.16	0.48
1:B:146:LYS:HG2	1:B:147:GLY:N	2.28	0.48
1:B:150:LEU:N	1:B:150:LEU:HD12	2.29	0.48
1:B:219:THR:CG2	1:B:237:LYS:HD2	2.44	0.48
1:A:218:ILE:HD12	1:A:218:ILE:N	2.27	0.47
1:A:135:VAL:HG11	1:A:224:ARG:HB2	1.94	0.47
1:A:132:ILE:CG2	1:A:227:MET:H	2.21	0.47
1:B:197:ARG:HG2	1:B:205:GLN:NE2	2.28	0.47
1:A:103:PRO:CB	1:A:321:SER:O	2.58	0.47
1:A:244:VAL:O	1:A:299:GLU:HA	2.14	0.47
1:A:283:LEU:HD13	1:A:296:LEU:HD13	1.95	0.47
1:A:153:LEU:HD22	1:A:153:LEU:C	2.35	0.47
1:B:132:ILE:CG1	1:B:133:ASP:H	2.28	0.47
1:A:256:TRP:HE1	1:B:106:PHE:HE2	1.62	0.47
1:B:198:LEU:C	1:B:198:LEU:HD23	2.35	0.47
1:B:339:GLN:O	1:B:340:ARG:HB3	2.14	0.47
1:A:252:GLU:HA	1:A:255:ALA:HB2	1.96	0.47
1:B:342:ILE:HG13	1:B:378:VAL:CG1	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:186:ARG:HA	1:B:190:MET:H	1.78	0.47
1:A:308:LYS:HB3	1:A:309:PRO:CD	2.44	0.47
1:A:275:THR:HG22	1:A:276:LEU:N	2.30	0.47
1:B:383:PHE:CG	1:B:384:LEU:N	2.82	0.47
1:A:92:LEU:O	1:A:92:LEU:HD22	2.15	0.47
1:B:317:LEU:HD12	1:B:318:ASN:H	1.81	0.46
1:A:379:SER:O	1:A:380:SER:HB2	2.16	0.46
1:B:141:GLY:HA2	1:B:218:ILE:O	2.15	0.46
1:A:117:ASN:C	1:A:119:TYR:H	2.19	0.46
1:B:252:GLU:HG2	1:B:292:ARG:HB3	1.98	0.46
1:A:334:ASP:O	1:A:335:THR:HG23	2.15	0.46
1:B:178:THR:O	1:B:181:ILE:HG22	2.15	0.46
1:A:355:VAL:HA	1:A:370:GLY:HA3	1.97	0.46
1:B:158:TRP:HZ2	1:B:189:GLY:O	1.99	0.46
1:A:159:VAL:HG23	1:A:204:ILE:CD1	2.46	0.46
1:A:167:LEU:HD12	1:A:167:LEU:C	2.35	0.46
1:A:219:THR:CG2	1:A:237:LYS:HD2	2.46	0.46
1:A:131:PHE:O	1:A:153:LEU:HB2	2.16	0.46
1:B:144:VAL:HG23	1:B:146:LYS:H	1.80	0.46
1:B:280:LYS:CG	1:B:281:TRP:N	2.79	0.46
1:A:91:ASN:CG	1:A:92:LEU:N	2.70	0.46
1:A:319:THR:HG22	1:A:320:ALA:H	1.80	0.46
1:A:285:PRO:HB3	1:B:358:PHE:O	2.16	0.45
1:A:208:PHE:N	1:A:208:PHE:CD1	2.83	0.45
1:B:351:VAL:HA	1:B:352:PRO:HD3	1.84	0.45
1:B:219:THR:O	1:B:220:ALA:HB3	2.16	0.45
1:A:148:THR:HB	1:A:149:PRO:HD2	1.99	0.45
1:B:340:ARG:HB3	1:B:354:ARG:HA	1.99	0.45
1:B:157:ASP:O	1:B:158:TRP:C	2.55	0.45
1:A:152:ASP:CG	1:A:209:THR:HG23	2.37	0.45
1:A:132:ILE:HD11	1:A:135:VAL:CG2	2.47	0.45
1:A:94:VAL:HG13	1:A:381:GLY:CA	2.37	0.45
1:B:202:GLN:NE2	1:B:202:GLN:HA	2.26	0.45
1:A:157:ASP:O	1:A:158:TRP:C	2.55	0.45
1:B:165:TYR:HE2	1:B:178:THR:HB	1.82	0.45
1:B:158:TRP:HE1	1:B:190:MET:CG	2.30	0.45
1:B:237:LYS:HG2	1:B:238:ILE:N	2.31	0.45
1:A:284:LEU:O	1:A:286:GLY:N	2.49	0.45
1:B:121:TYR:CD2	1:B:121:TYR:C	2.90	0.45
1:B:334:ASP:O	1:B:335:THR:HG23	2.17	0.45
1:A:302:ASN:OD1	1:A:302:ASN:C	2.55	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:242:ASP:HB3	1:B:243:PRO:HD3	1.98	0.44
1:A:112:ALA:HB1	1:A:246:VAL:CG2	2.46	0.44
1:B:250:ILE:HD13	1:B:250:ILE:HA	1.75	0.44
1:A:347:ASP:HB2	1:A:349:ARG:HG2	1.98	0.44
1:B:224:ARG:O	1:B:225:ALA:HB3	2.18	0.44
1:B:146:LYS:CG	1:B:147:GLY:N	2.80	0.44
1:A:278:ILE:CD1	1:A:298:LEU:HD22	2.41	0.44
1:B:342:ILE:O	1:B:377:VAL:HG23	2.18	0.44
1:B:150:LEU:O	1:B:151:LEU:HB3	2.17	0.44
1:B:346:ALA:C	1:B:348:GLY:H	2.21	0.44
1:B:345:ASP:O	1:B:347:ASP:N	2.50	0.44
1:A:146:LYS:CG	1:A:147:GLY:N	2.81	0.44
1:A:283:LEU:O	1:A:285:PRO:HD3	2.17	0.44
1:B:99:VAL:HG22	1:B:327:ILE:HG22	2.00	0.44
1:B:112:ALA:HB1	1:B:246:VAL:CG2	2.45	0.43
1:B:132:ILE:CG2	1:B:227:MET:N	2.82	0.43
1:A:254:ILE:CG2	1:A:254:ILE:O	2.65	0.43
1:B:245:TRP:CZ2	1:B:297:ARG:HD3	2.54	0.43
1:B:342:ILE:HG21	1:B:378:VAL:HG12	2.01	0.43
1:A:168:LEU:C	1:A:170:GLU:H	2.21	0.43
1:A:288:ASP:OD2	1:A:290:ALA:HB3	2.18	0.43
1:B:371:LEU:HB3	1:B:372:ALA:H	1.71	0.43
1:B:308:LYS:HD2	1:B:308:LYS:H	1.83	0.43
1:B:273:ASP:HB3	1:B:274:LYS:HD2	2.00	0.43
1:A:342:ILE:HG21	1:A:378:VAL:HG12	2.01	0.43
1:B:156:PRO:O	1:B:159:VAL:HG23	2.19	0.43
1:B:347:ASP:HB2	1:B:349:ARG:HG2	2.01	0.43
1:B:91:ASN:ND2	1:B:93:GLY:H	2.17	0.43
1:A:94:VAL:CG1	1:A:95:LYS:H	2.25	0.43
1:B:379:SER:O	1:B:380:SER:HB2	2.18	0.43
1:B:210:LEU:C	1:B:210:LEU:HD12	2.39	0.43
1:B:308:LYS:HD2	1:B:308:LYS:N	2.34	0.43
1:B:261:ALA:HA	1:B:264:PHE:CD1	2.54	0.43
1:A:250:ILE:HD13	1:A:250:ILE:HA	1.86	0.43
1:A:252:GLU:HG3	1:A:253:SER:N	2.33	0.43
1:A:91:ASN:HD21	1:A:93:GLY:H	1.66	0.43
1:A:257:LEU:HB3	1:A:319:THR:HG23	2.00	0.43
1:A:275:THR:C	1:A:276:LEU:HD22	2.39	0.43
1:A:275:THR:HG22	1:A:276:LEU:H	1.83	0.43
1:A:134:LYS:O	1:A:135:VAL:CB	2.66	0.42
1:A:383:PHE:CD1	1:A:384:LEU:N	2.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:156:PRO:O	1:B:157:ASP:C	2.58	0.42
1:B:134:LYS:O	1:B:135:VAL:CB	2.67	0.42
1:B:326:LEU:N	1:B:326:LEU:HD22	2.34	0.42
1:A:165:TYR:HB2	1:A:181:ILE:HG21	2.00	0.42
1:A:327:ILE:HG13	1:A:365:THR:HG23	2.00	0.42
1:A:151:LEU:N	1:A:151:LEU:HD23	2.34	0.42
1:A:281:TRP:HB3	1:A:298:LEU:CD2	2.46	0.42
1:A:185:LEU:HD23	1:A:190:MET:SD	2.59	0.42
1:B:256:TRP:CE2	1:B:257:LEU:HD22	2.54	0.42
1:A:377:VAL:HG22	1:A:378:VAL:H	1.84	0.42
1:A:95:LYS:O	1:A:378:VAL:HG23	2.20	0.42
1:A:205:GLN:HA	1:A:205:GLN:OE1	2.18	0.42
1:A:283:LEU:HD21	1:A:294:LEU:HD12	2.01	0.42
1:A:256:TRP:CE3	1:B:322:GLU:HG2	2.55	0.42
1:A:256:TRP:CZ3	1:A:257:LEU:HD13	2.55	0.42
1:A:144:VAL:HG23	1:A:146:LYS:H	1.85	0.42
1:A:278:ILE:HG23	1:A:278:ILE:O	2.18	0.42
1:B:275:THR:C	1:B:276:LEU:HD22	2.40	0.42
1:B:274:LYS:HB2	1:B:275:THR:H	1.45	0.42
1:A:114:VAL:HG21	1:A:311:MET:HB2	2.02	0.42
1:A:339:GLN:HE22	1:A:357:VAL:HG22	1.84	0.42
1:B:282:THR:OG1	1:B:283:LEU:N	2.53	0.42
1:A:142:ASP:HB2	1:A:218:ILE:HD13	2.01	0.42
1:B:250:ILE:HA	1:B:251:PRO:HD3	1.84	0.42
1:B:333:ILE:HD12	1:B:334:ASP:H	1.84	0.42
1:B:168:LEU:CB	1:B:178:THR:HG22	2.50	0.42
1:A:229:ILE:HD12	1:A:229:ILE:N	2.34	0.42
1:B:275:THR:HG22	1:B:276:LEU:N	2.35	0.42
1:A:136:TYR:HD2	1:A:136:TYR:N	2.17	0.42
1:B:223:LEU:H	1:B:223:LEU:HD23	1.85	0.42
1:A:333:ILE:HG22	1:A:341:VAL:HG12	2.02	0.41
1:B:92:LEU:HD22	1:B:92:LEU:O	2.20	0.41
1:B:146:LYS:HG2	1:B:147:GLY:H	1.83	0.41
1:B:332:LEU:HA	1:B:341:VAL:HG21	2.02	0.41
1:A:214:ILE:HD13	1:A:214:ILE:H	1.85	0.41
1:A:144:VAL:HG12	1:A:218:ILE:CD1	2.49	0.41
1:A:308:LYS:H	1:A:311:MET:CE	2.33	0.41
1:B:213:PRO:HB2	1:B:214:ILE:HG23	2.02	0.41
1:A:279:ARG:HD3	1:A:301:ASP:OD1	2.20	0.41
1:A:341:VAL:HB	1:A:342:ILE:H	1.51	0.41
1:A:202:GLN:NE2	1:A:202:GLN:HA	2.28	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:223:LEU:N	1:B:223:LEU:HD23	2.35	0.41
1:A:244:VAL:CG1	1:A:245:TRP:N	2.83	0.41
1:B:102:GLY:O	1:B:323:PRO:HA	2.20	0.41
1:B:219:THR:HG23	1:B:237:LYS:HD2	2.02	0.41
1:B:367:LEU:HD22	1:B:367:LEU:H	1.84	0.41
1:A:340:ARG:HB3	1:A:354:ARG:HA	2.01	0.41
1:B:132:ILE:HA	1:B:153:LEU:HB2	2.03	0.41
1:A:358:PHE:HB2	1:A:368:ARG:HB2	2.03	0.41
1:A:308:LYS:H	1:A:308:LYS:HD2	1.85	0.41
1:A:142:ASP:N	1:A:218:ILE:HD13	2.33	0.41
1:B:156:PRO:HB2	1:B:157:ASP:H	1.59	0.41
1:B:218:ILE:HA	1:B:238:ILE:HD13	2.02	0.41
1:A:156:PRO:O	1:A:157:ASP:C	2.59	0.41
1:B:116:TYR:CE2	1:B:241:MET:HG2	2.56	0.41
1:A:283:LEU:HD11	1:A:294:LEU:HB2	2.02	0.41
1:B:223:LEU:H	1:B:223:LEU:CD2	2.31	0.41
1:B:162:GLN:NE2	1:B:205:GLN:HB2	2.29	0.41
1:A:155:ILE:HA	1:A:156:PRO:HD2	1.89	0.41
1:B:218:ILE:H	1:B:218:ILE:HD12	1.86	0.41
1:B:280:LYS:HG2	1:B:281:TRP:H	1.83	0.41
1:A:117:ASN:HA	1:A:245:TRP:CE3	2.56	0.41
1:A:257:LEU:HD13	1:A:257:LEU:HA	1.89	0.41
1:A:256:TRP:CZ2	1:A:257:LEU:HD21	2.56	0.41
1:B:250:ILE:O	1:B:294:LEU:N	2.52	0.41
1:B:167:LEU:HD12	1:B:167:LEU:C	2.41	0.41
1:A:150:LEU:O	1:A:151:LEU:HB3	2.21	0.40
1:A:218:ILE:CD1	1:A:218:ILE:H	2.32	0.40
1:B:153:LEU:CD2	1:B:155:ILE:HG12	2.52	0.40
1:A:304:ASP:OD1	1:A:306:ALA:HB2	2.20	0.40
1:A:344:VAL:HG22	1:A:350:PHE:HD1	1.86	0.40
1:B:353:LYS:HD2	1:B:353:LYS:HA	1.85	0.40
1:A:153:LEU:HD13	1:A:153:LEU:C	2.41	0.40
1:B:222:ASP:OD1	1:B:223:LEU:HD23	2.21	0.40
1:B:150:LEU:HB2	1:B:151:LEU:HD22	2.03	0.40
1:B:325:LEU:H	1:B:325:LEU:HG	1.59	0.40
1:A:238:ILE:HG22	1:A:239:GLN:N	2.37	0.40
1:B:357:VAL:HG23	1:B:357:VAL:O	2.21	0.40
1:B:322:GLU:HA	1:B:323:PRO:HD3	1.89	0.40
1:A:159:VAL:HG23	1:A:204:ILE:HD13	2.03	0.40
1:A:107:ALA:O	1:A:108:GLN:HB2	2.21	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	294/413 (71%)	220 (75%)	45 (15%)	29 (10%)	1	13
1	B	295/413 (71%)	218 (74%)	48 (16%)	29 (10%)	1	14
All	All	589/826 (71%)	438 (74%)	93 (16%)	58 (10%)	1	14

All (58) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	135	VAL
1	A	146	LYS
1	A	156	PRO
1	A	157	ASP
1	A	206	THR
1	A	274	LYS
1	A	279	ARG
1	A	290	ALA
1	A	292	ARG
1	A	335	THR
1	A	346	ALA
1	B	135	VAL
1	B	146	LYS
1	B	157	ASP
1	B	206	THR
1	B	221	PHE
1	B	279	ARG
1	B	290	ALA
1	B	292	ARG
1	B	335	THR
1	B	382	LEU
1	A	204	ILE
1	A	221	PHE
1	A	222	ASP
1	A	288	ASP

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Mol	Chain	Res	Type
1	A	341	VAL
1	A	382	LEU
1	B	108	GLN
1	B	156	PRO
1	B	222	ASP
1	B	231	LYS
1	B	255	ALA
1	B	274	LYS
1	B	341	VAL
1	B	346	ALA
1	A	108	GLN
1	A	220	ALA
1	A	231	LYS
1	A	272	PRO
1	A	273	ASP
1	A	347	ASP
1	B	225	ALA
1	B	232	ASP
1	B	273	ASP
1	A	213	PRO
1	B	220	ALA
1	A	232	ASP
1	A	285	PRO
1	A	340	ARG
1	B	172	GLY
1	B	204	ILE
1	B	213	PRO
1	B	347	ASP
1	A	225	ALA
1	B	118	GLU
1	B	272	PRO
1	B	285	PRO
1	A	243	PRO

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	242/338 (72%)	192 (79%)	50 (21%)	1	11
1	B	243/338 (72%)	194 (80%)	49 (20%)	1	12
All	All	485/676 (72%)	386 (80%)	99 (20%)	1	11

All (99) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	92	LEU
1	A	109	SER
1	A	113	ASN
1	A	114	VAL
1	A	116	TYR
1	A	121	TYR
1	A	124	VAL
1	A	136	TYR
1	A	142	ASP
1	A	144	VAL
1	A	148	THR
1	A	151	LEU
1	A	152	ASP
1	A	153	LEU
1	A	157	ASP
1	A	158	TRP
1	A	183	GLU
1	A	185	LEU
1	A	187	LEU
1	A	202	GLN
1	A	208	PHE
1	A	209	THR
1	A	214	ILE
1	A	215	ASP
1	A	219	THR
1	A	222	ASP
1	A	223	LEU
1	A	224	ARG
1	A	231	LYS
1	A	235	VAL
1	A	246	VAL
1	A	253	SER
1	A	259	LYS
1	A	268	VAL
1	A	277	THR

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Mol	Chain	Res	Type
1	A	282	THR
1	A	307	LEU
1	A	335	THR
1	A	338	GLU
1	A	345	ASP
1	A	350	PHE
1	A	351	VAL
1	A	362	GLN
1	A	365	THR
1	A	367	LEU
1	A	373	GLU
1	A	375	GLU
1	A	382	LEU
1	A	383	PHE
1	A	385	ILE
1	B	92	LEU
1	B	109	SER
1	B	121	TYR
1	B	136	TYR
1	B	138	LEU
1	B	142	ASP
1	B	144	VAL
1	B	148	THR
1	B	151	LEU
1	B	152	ASP
1	B	153	LEU
1	B	155	ILE
1	B	157	ASP
1	B	158	TRP
1	B	183	GLU
1	B	190	MET
1	B	194	ASP
1	B	202	GLN
1	B	208	PHE
1	B	209	THR
1	B	214	ILE
1	B	215	ASP
1	B	219	THR
1	B	222	ASP
1	B	223	LEU
1	B	224	ARG
1	B	231	LYS

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Mol	Chain	Res	Type
1	B	235	VAL
1	B	246	VAL
1	B	253	SER
1	B	259	LYS
1	B	268	VAL
1	B	274	LYS
1	B	275	THR
1	B	277	THR
1	B	282	THR
1	B	307	LEU
1	B	325	LEU
1	B	335	THR
1	B	338	GLU
1	B	341	VAL
1	B	345	ASP
1	B	350	PHE
1	B	362	GLN
1	B	365	THR
1	B	367	LEU
1	B	368	ARG
1	B	382	LEU
1	B	383	PHE

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

Mol	Chain	Res	Type
1	A	91	ASN
1	A	162	GLN
1	A	202	GLN
1	A	318	ASN
1	A	330	GLN
1	A	339	GLN
1	B	91	ASN
1	B	162	GLN
1	B	202	GLN
1	B	339	GLN

### 5.3.3 RNA ⓘ

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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å <sup>2</sup> )	Q<0.9
1	A	296/413 (71%)	0.13	10 (3%)	49 34	112, 202, 318, 446	0
1	B	297/413 (71%)	0.30	15 (5%)	32 21	120, 214, 362, 581	0
All	All	593/826 (71%)	0.22	25 (4%)	40 27	112, 209, 343, 581	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	201	THR	7.6
1	B	200	ALA	3.4
1	A	90	GLN	3.2
1	B	158	TRP	3.1
1	B	89	THR	2.8
1	B	223	LEU	2.8
1	B	178	THR	2.7
1	B	222	ASP	2.7
1	A	211	LYS	2.7
1	B	124	VAL	2.7
1	A	385	ILE	2.6
1	B	228	ASN	2.6
1	A	129	ALA	2.5
1	A	157	ASP	2.5
1	A	91	ASN	2.5
1	A	236	ALA	2.5
1	B	337	SER	2.4
1	A	343	THR	2.4
1	A	340	ARG	2.3
1	B	172	GLY	2.2
1	B	165	TYR	2.2
1	A	221	PHE	2.1
1	B	208	PHE	2.1
1	B	193	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	145	GLN	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	AG	A	414	1/1	0.77	1.36	11.75	400,400,400,400	0
2	AG	B	414	1/1	0.80	1.08	-	268,268,268,268	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.