



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 08:02 PM JST

PDB ID : 8WPZ / pdb_00008wpz
EMDB ID : EMD-37727
Title : Cryo-ET structure of RuBisCO at 3.9 angstroms from Synechococcus elongatus PCC 7942
Authors : Kong, W.W.; Jiang, Y.L.; Zhou, C.Z.
Deposited on : 2023-10-10
Resolution : 3.90 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

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

EMDB validation analysis : **FAILED**
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

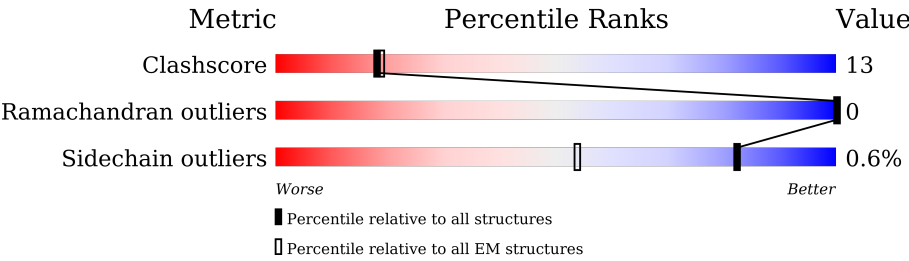
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.90 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	111	68% 20% • 10%
1	B	111	60% 30% 10%
1	E	111	66% 23% • 10%
1	F	111	61% 28% • 10%
1	I	111	61% 28% • 10%
1	L	111	62% 27% • 10%
1	M	111	64% 26% 10%
1	P	111	60% 29% • 10%
2	C	472	75% 23% •

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Mol	Chain	Length	Quality of chain
2	D	472	 71% 26% .
2	G	472	 71% 26% .
2	H	472	 70% 28% .
2	J	472	 70% 28% .
2	K	472	 70% 27% .
2	N	472	 71% 27% .
2	O	472	 75% 23% .

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 35774 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Ribulose biphosphate carboxylase small subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	B	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	E	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	F	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	I	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	L	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	M	100	Total	C	N	O	S	0	0
			848	544	142	156	6		
1	P	100	Total	C	N	O	S	0	0
			848	544	142	156	6		

- Molecule 2 is a protein called Ribulose biphosphate carboxylase large chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	460	Total	C	N	O	S	0	0
			3611	2299	631	663	18		
2	D	460	Total	C	N	O	S	0	0
			3611	2299	631	663	18		
2	G	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		
2	H	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		
2	J	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		
2	K	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		
2	N	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	O	462	Total	C	N	O	S	0	0
			3628	2309	634	667	18		

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. 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. 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.

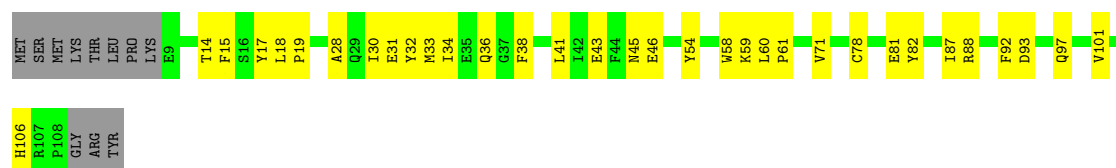
- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain A: 



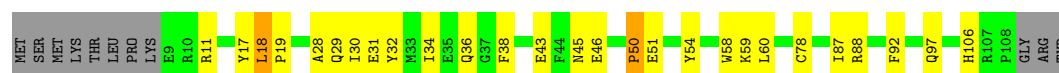
- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain B: 



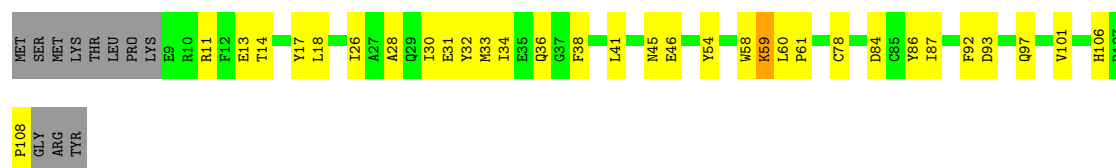
- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain E: 



- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain F: 



- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain I: 



ARG
TYR

- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain L:  62% 27% 10%

MET SER MET MET THR LEU PRO LYS E9 R10 Y17 A28 Q29 I30 E31 Y32 M33 I34 E35 Q36 G37 F38 L41 M45 E46 H47 S48 Y54 W58 K59 L60 P61 V71 C78 D84 I87 D93 K96 Q97 H106 R107 P108 GLY ARG TYR

- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain M:  64% 26% 10%

MET SER MET MET THR LEU PRO LYS E9 E13 T14 F15 S16 Y17 P19 Q29 I30 I34 E43 F44 M45 E46 N49 E52 E53 Y54 W58 K59 L60 P61 L62 V71 C78 D84 G85 Y86 I87 R88 Q97 V105 H106 R107 P108 GLY ARG TYR

- Molecule 1: Ribulose biphosphate carboxylase small subunit

Chain P:  60% 29% 10%

MET SER MET MET THR LEU PRO LYS E9 F12 E13 T14 F15 S16 Y17 L18 Q29 I30 E31 Y32 M33 I34 F35 Q36 G37 F38 L41 L42 E43 F44 N45 E46 Y54 M57 W58 K59 L60 P61 V71 C78 D84 I87 R88 D93 Q97 V101 H106

R107 P108 GLY ARG TYR

- Molecule 2: Ribulose biphosphate carboxylase large chain

Chain C:  75% 23% 2%

MET PRO LYS THR GLN SER ALA ALA GLY Y10 D32 S40 I54 D200 S59 T60 L70 M74 E85 P86 E91 E107 I117 V118 V121 F122 G123 F124 K125 R128 S129 E133 D134 I135 V139 V142 R143 T144 E155 M166 L167 T170

P173 K174 L175 G176 L177 S178 M181 Y182 G183 L190 T197 K198 D199 D200 E201 N202 S205 R210 E231 I232 K233 G234 H235 E239 T240 A241 E246 M247 K255 I261 I262 D265 F266 L267 T268 A269 G270 A273 R282 L287 M294 D299 R300 E437

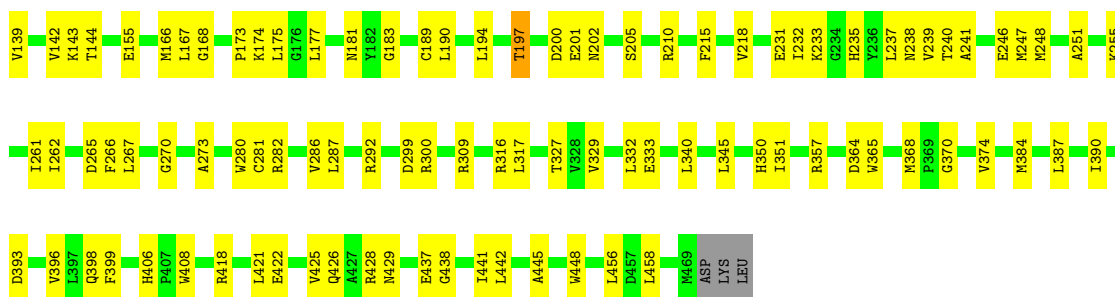
R309 R316 L317 L323 T327 V328 G330 K331 L332 E333 L340 G341 F342 L345 M346 H350 I351 E352 A353 R354 G355 S356 R357 T362 Q363 D364 W365 A366 S367 M368 F369 G370 V374 L387 I390 I117 V396 F399 R418 L421 Q426 N429 E437

G438 I441 L442 A445 W448 L456 M469 ASP LYS LEU

- Molecule 2: Ribulose biphosphate carboxylase large chain

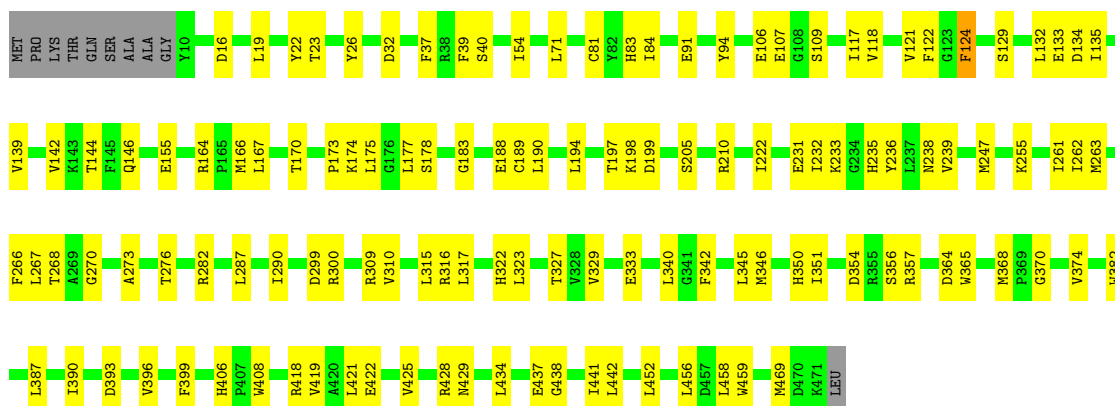
Chain D:  71% 26% 3%

MET PRO LYS THR GLN SER ALA ALA GLY Y10 K18 D32 F39 S40 P41 Q42 E49 I54 E57 L71 M74 C81 I84 E91 Y94 I98 E107 L114 T115 S116 I117 V118 F122 G123 F124 K125 R128 S129 E133 D134 I135



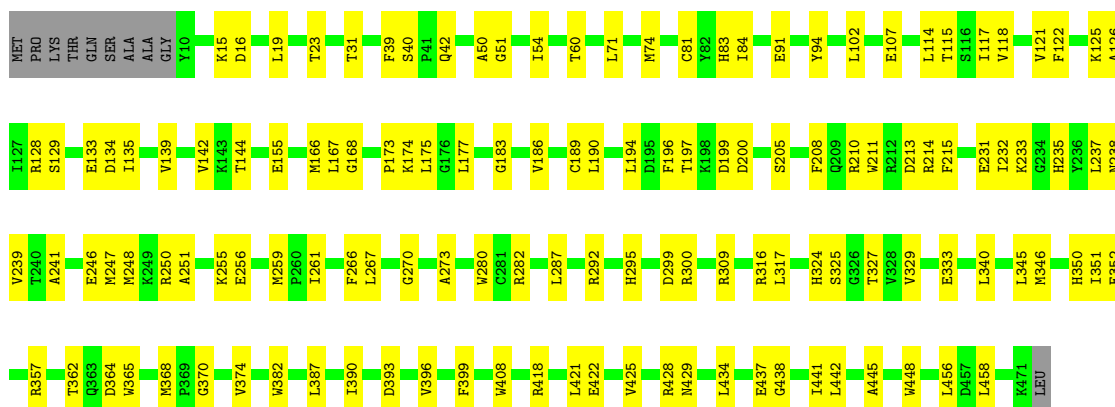
• Molecule 2: Ribulose biphosphate carboxylase large chain

Chain G: 71% 26% .



• Molecule 2: Ribulose bisphosphate carboxylase large chain

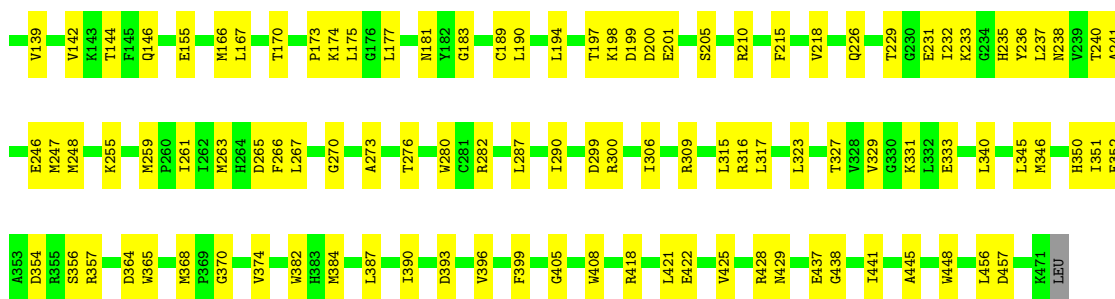
Chain H: 70% 28% .



• Molecule 2: Ribulose bisphosphate carboxylase large chain

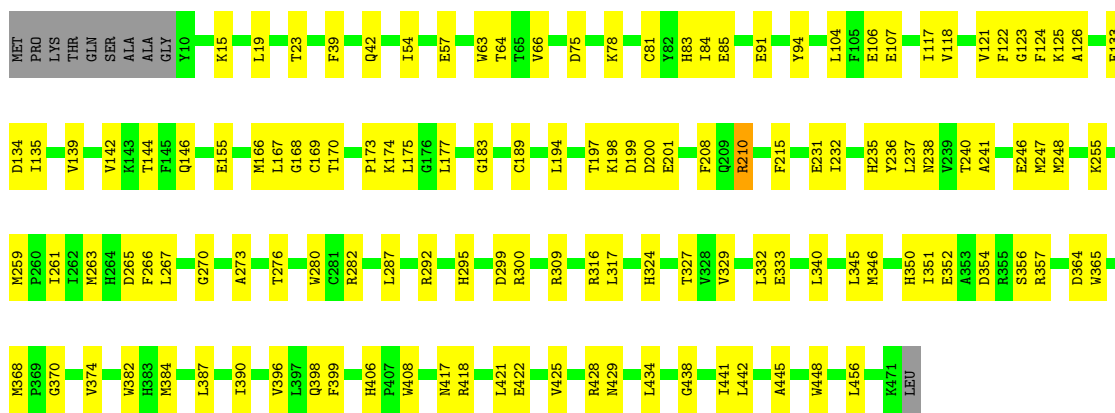
Chain J: 70% 28% .





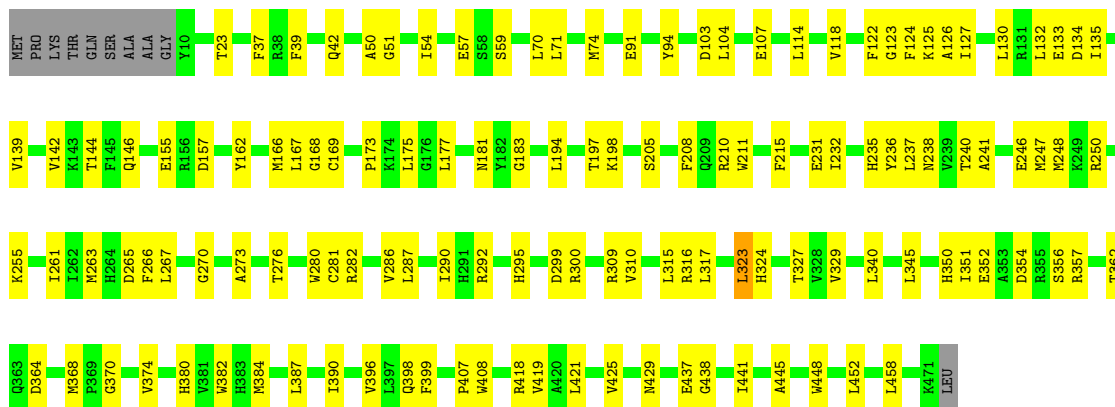
• Molecule 2: Ribulose biphosphate carboxylase large chain

Chain K: 70% 27%



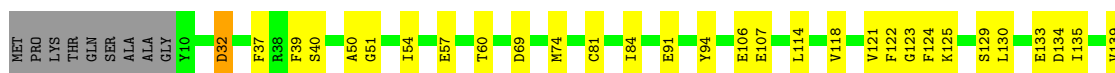
• Molecule 2: Ribulose biphosphate carboxylase large chain

Chain N: 71% 27%



• Molecule 2: Ribulose biphosphate carboxylase large chain

Chain O: 75% 23%





4 Experimental information

Property	Value	Source
EM reconstruction method	SUBTOMOGRAM AVERAGING	Depositor
Imposed symmetry	POINT, Not provided	
Number of subtomograms used	2700	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	145	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.21	0/874	0.58	5/1184 (0.4%)
1	B	0.16	0/874	0.42	0/1184
1	E	0.28	0/874	0.49	1/1184 (0.1%)
1	F	0.26	0/874	0.52	1/1184 (0.1%)
1	I	0.21	0/874	0.45	1/1184 (0.1%)
1	L	0.23	0/874	0.45	1/1184 (0.1%)
1	M	0.15	0/874	0.33	0/1184
1	P	0.20	0/874	0.46	1/1184 (0.1%)
2	C	0.16	0/3703	0.36	0/5016
2	D	0.14	0/3703	0.35	0/5016
2	G	0.15	0/3720	0.35	0/5038
2	H	0.16	0/3720	0.37	0/5038
2	J	0.17	0/3720	0.36	0/5038
2	K	0.17	0/3720	0.37	0/5038
2	N	0.16	0/3720	0.35	0/5038
2	O	0.16	0/3720	0.35	0/5038
All	All	0.17	0/36718	0.38	10/49732 (0.0%)

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	108	PRO	CA-N-CD	-8.07	100.70	112.00
1	A	106	HIS	CA-C-N	6.44	137.52	123.15
1	A	106	HIS	C-N-CA	6.44	137.52	123.15
1	L	59	LYS	CB-CA-C	-6.39	109.19	116.54
1	P	59	LYS	CB-CA-C	-6.11	109.51	116.54
1	E	50	PRO	CA-N-CD	-5.99	103.61	112.00
1	F	59	LYS	CB-CA-C	-5.86	109.80	116.54
1	A	108	PRO	N-CD-CG	-5.32	95.21	103.20
1	A	59	LYS	CB-CA-C	-5.22	110.54	116.54
1	I	59	LYS	CB-CA-C	-5.08	110.74	116.63

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	848	0	797	22	0
1	B	848	0	797	31	0
1	E	848	0	797	32	0
1	F	848	0	797	33	0
1	I	848	0	797	28	0
1	L	848	0	797	34	0
1	M	848	0	797	23	0
1	P	848	0	797	35	0
2	C	3611	0	3527	82	0
2	D	3611	0	3527	106	0
2	G	3628	0	3544	104	0
2	H	3628	0	3544	109	0
2	J	3628	0	3544	101	0
2	K	3628	0	3544	98	0
2	N	3628	0	3544	92	0
2	O	3628	0	3544	94	0
All	All	35774	0	34694	915	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 13.

All (915) 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)
2:J:261:ILE:HG13	2:J:287:LEU:HB2	1.41	1.01
2:N:261:ILE:HG13	2:N:287:LEU:HB2	1.44	0.99
2:G:261:ILE:HG13	2:G:287:LEU:HB2	1.46	0.97
1:L:29:GLN:OE1	2:O:429:ASN:ND2	2.01	0.94
1:F:17:TYR:CE2	2:G:418:ARG:HG2	2.06	0.89
1:L:29:GLN:NE2	2:O:429:ASN:HD22	1.72	0.86
1:E:32:TYR:HD2	2:H:429:ASN:ND2	1.72	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:32:TYR:HD2	2:H:429:ASN:HD22	1.18	0.85
2:O:316:ARG:HH12	2:O:370:GLY:HA2	1.42	0.85
1:L:29:GLN:HE22	2:O:429:ASN:HD22	1.21	0.84
2:K:429:ASN:ND2	1:P:29:GLN:OE1	2.10	0.84
2:K:316:ARG:HH12	2:K:370:GLY:HA2	1.42	0.84
2:H:316:ARG:HH12	2:H:370:GLY:HA2	1.44	0.83
2:D:316:ARG:HH12	2:D:370:GLY:HA2	1.44	0.83
1:E:58:TRP:HD1	1:E:59:LYS:HG2	1.42	0.83
2:G:316:ARG:HH12	2:G:370:GLY:HA2	1.44	0.82
2:J:316:ARG:HH12	2:J:370:GLY:HA2	1.44	0.82
2:N:316:ARG:HH12	2:N:370:GLY:HA2	1.45	0.81
1:E:32:TYR:CD2	2:H:429:ASN:ND2	2.47	0.81
2:O:469:MET:HE2	2:O:469:MET:HA	1.63	0.81
2:C:316:ARG:HH12	2:C:370:GLY:HA2	1.45	0.80
2:N:425:VAL:O	2:N:429:ASN:HB2	1.82	0.80
1:F:36:GLN:N	1:F:36:GLN:OE1	2.15	0.80
1:B:18:LEU:HD12	1:B:19:PRO:HD2	1.65	0.79
1:L:97:GLN:O	1:L:97:GLN:NE2	2.16	0.78
1:L:17:TYR:HE2	2:O:418:ARG:HG2	1.48	0.78
2:D:181:ASN:OD1	1:M:97:GLN:NE2	2.18	0.76
2:K:418:ARG:HG2	1:P:17:TYR:HE2	1.50	0.76
1:F:13:GLU:OE1	1:F:14:THR:N	2.13	0.76
2:G:247:MET:HE1	2:G:273:ALA:HB1	1.68	0.76
2:H:174:LYS:HD2	2:H:200:ASP:OD2	1.85	0.76
2:K:174:LYS:HD2	2:K:200:ASP:OD2	1.85	0.75
1:F:87:ILE:HB	1:F:106:HIS:HB3	1.68	0.74
2:J:247:MET:HE1	2:J:273:ALA:HB1	1.69	0.74
2:K:117:ILE:HG22	2:K:118:VAL:HG13	1.69	0.74
1:B:17:TYR:HE2	2:C:418:ARG:HG2	1.52	0.74
2:C:181:ASN:OD1	1:I:97:GLN:NE2	2.21	0.74
1:F:45:ASN:OD1	1:F:46:GLU:N	2.21	0.73
1:P:45:ASN:OD1	1:P:46:GLU:N	2.22	0.73
2:K:292:ARG:HH22	2:K:332:LEU:HD13	1.53	0.72
2:H:247:MET:HE1	2:H:273:ALA:HB1	1.71	0.72
1:B:58:TRP:HE1	1:B:59:LYS:HZ3	1.37	0.72
2:N:91:GLU:N	2:N:91:GLU:OE1	2.23	0.72
2:N:51:GLY:HA2	2:N:54:ILE:HD12	1.72	0.72
2:C:247:MET:HE1	2:C:273:ALA:HB1	1.72	0.72
1:B:87:ILE:HB	1:B:106:HIS:HB3	1.70	0.71
2:N:50:ALA:O	2:N:54:ILE:HG13	1.90	0.71
2:O:91:GLU:OE2	2:O:91:GLU:N	2.23	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:O:374:VAL:HG23	2:O:396:VAL:HB	1.70	0.71
2:C:91:GLU:N	2:C:91:GLU:OE1	2.24	0.71
2:G:91:GLU:N	2:G:91:GLU:OE1	2.24	0.71
1:I:32:TYR:HD2	2:J:429:ASN:OD1	1.72	0.71
2:D:261:ILE:HG13	2:D:287:LEU:HB2	1.72	0.71
1:E:32:TYR:HE1	1:E:36:GLN:NE2	1.88	0.71
2:J:122:PHE:O	2:K:300:ARG:NH1	2.23	0.71
1:E:17:TYR:HE2	2:H:418:ARG:HG2	1.55	0.71
1:L:87:ILE:HB	1:L:106:HIS:HB3	1.73	0.70
1:B:45:ASN:OD1	1:B:46:GLU:N	2.24	0.70
1:E:45:ASN:OD1	1:E:46:GLU:N	2.24	0.70
2:K:91:GLU:OE1	2:K:91:GLU:N	2.24	0.70
2:D:91:GLU:OE1	2:D:91:GLU:N	2.23	0.70
2:J:200:ASP:OD1	2:J:201:GLU:N	2.24	0.70
1:L:29:GLN:CD	2:O:429:ASN:HD22	2.00	0.70
1:M:45:ASN:OD1	1:M:46:GLU:N	2.24	0.70
1:M:87:ILE:HB	1:M:106:HIS:HB3	1.74	0.70
1:P:87:ILE:HB	1:P:106:HIS:HB3	1.73	0.70
1:E:58:TRP:CD1	1:E:59:LYS:HG2	2.25	0.70
2:H:91:GLU:N	2:H:91:GLU:OE1	2.24	0.70
1:E:32:TYR:CE1	1:E:36:GLN:NE2	2.60	0.69
2:K:142:VAL:HG23	2:K:317:LEU:HD21	1.75	0.69
1:L:45:ASN:OD1	1:L:46:GLU:N	2.24	0.69
2:K:197:THR:OG1	2:K:235:HIS:ND1	2.26	0.69
1:F:17:TYR:HE2	2:G:418:ARG:HG2	1.53	0.69
2:N:300:ARG:NH1	2:O:122:PHE:O	2.25	0.69
2:G:107:GLU:HB2	2:G:144:THR:HG21	1.75	0.68
2:N:122:PHE:O	2:O:300:ARG:NH1	2.26	0.68
2:N:247:MET:HE1	2:N:273:ALA:HB1	1.75	0.68
2:H:142:VAL:HG23	2:H:317:LEU:HD21	1.75	0.68
2:O:142:VAL:HG23	2:O:317:LEU:HD21	1.75	0.68
2:G:122:PHE:O	2:H:300:ARG:NH1	2.27	0.68
1:I:87:ILE:HB	1:I:106:HIS:HB3	1.75	0.68
1:A:17:TYR:HE2	2:D:418:ARG:HG2	1.58	0.68
2:C:117:ILE:HG22	2:C:118:VAL:HG13	1.76	0.68
2:C:300:ARG:NH1	2:D:122:PHE:O	2.27	0.68
2:D:247:MET:HE1	2:D:273:ALA:HB1	1.76	0.67
2:G:133:GLU:OE1	2:G:309:ARG:NH1	2.28	0.67
2:C:142:VAL:HG23	2:C:317:LEU:HD21	1.77	0.67
2:J:300:ARG:NH1	2:K:122:PHE:O	2.27	0.67
2:J:199:ASP:OD1	2:J:235:HIS:NE2	2.28	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:231:GLU:OE1	2:K:232:ILE:N	2.27	0.67
2:D:142:VAL:HG23	2:D:317:LEU:HD21	1.77	0.67
2:G:142:VAL:HG23	2:G:317:LEU:HD21	1.77	0.67
2:K:374:VAL:HG22	2:K:396:VAL:HB	1.76	0.66
2:N:270:GLY:HA3	2:O:270:GLY:HA3	1.78	0.66
2:N:133:GLU:OE1	2:N:309:ARG:NH1	2.28	0.66
2:H:199:ASP:OD1	2:H:235:HIS:NE2	2.27	0.66
2:C:345:LEU:HD23	2:C:351:ILE:HD13	1.77	0.66
2:K:438:GLY:HA2	2:K:441:ILE:HD12	1.78	0.66
2:H:374:VAL:HG22	2:H:396:VAL:HB	1.77	0.66
2:C:270:GLY:HA3	2:D:270:GLY:HA3	1.78	0.66
2:G:270:GLY:HA3	2:H:270:GLY:HA3	1.78	0.66
2:C:133:GLU:OE1	2:C:309:ARG:NH1	2.28	0.66
2:J:270:GLY:HA3	2:K:270:GLY:HA3	1.77	0.65
2:C:374:VAL:HG22	2:C:396:VAL:HB	1.76	0.65
2:J:142:VAL:HG23	2:J:317:LEU:HD21	1.78	0.65
2:O:438:GLY:HA2	2:O:441:ILE:HD12	1.79	0.65
2:D:133:GLU:OE1	2:D:309:ARG:NH1	2.28	0.65
2:D:240:THR:OG1	2:D:265:ASP:OD1	2.14	0.65
2:G:300:ARG:NH1	2:H:122:PHE:O	2.29	0.65
2:N:142:VAL:HG23	2:N:317:LEU:HD21	1.78	0.65
2:H:133:GLU:OE1	2:H:309:ARG:NH1	2.28	0.65
2:J:374:VAL:HG22	2:J:396:VAL:HB	1.78	0.65
1:A:87:ILE:HB	1:A:106:HIS:HB3	1.77	0.65
2:H:15:LYS:HD2	2:H:16:ASP:N	2.12	0.65
2:N:290:ILE:HG21	2:N:315:LEU:HD11	1.79	0.65
2:D:374:VAL:HG22	2:D:396:VAL:HB	1.79	0.65
1:B:97:GLN:NE2	2:O:181:ASN:OD1	2.21	0.64
2:D:174:LYS:NZ	2:D:200:ASP:OD2	2.30	0.64
1:A:84:ASP:OD1	1:A:85:CYS:N	2.29	0.64
1:L:17:TYR:CE2	2:O:418:ARG:HG2	2.30	0.64
2:G:374:VAL:HG22	2:G:396:VAL:HB	1.78	0.64
2:G:231:GLU:OE2	2:G:232:ILE:N	2.31	0.64
2:K:425:VAL:O	2:K:429:ASN:HB2	1.98	0.64
2:G:197:THR:OG1	2:G:235:HIS:ND1	2.30	0.64
2:H:50:ALA:O	2:H:54:ILE:HG13	1.98	0.64
2:O:247:MET:HE1	2:O:273:ALA:HB1	1.78	0.64
2:C:122:PHE:O	2:D:300:ARG:NH1	2.31	0.63
2:N:438:GLY:HA2	2:N:441:ILE:HD12	1.80	0.63
2:K:247:MET:HE1	2:K:273:ALA:HB1	1.79	0.63
1:A:18:LEU:HD12	1:A:19:PRO:HD2	1.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:40:SER:HG	2:H:129:SER:HG	1.46	0.63
1:F:17:TYR:CE2	2:G:418:ARG:CG	2.80	0.63
1:A:17:TYR:CE2	2:D:418:ARG:HG2	2.33	0.63
2:C:350:HIS:ND1	2:C:364:ASP:OD1	2.31	0.63
1:L:29:GLN:CD	2:O:429:ASN:ND2	2.56	0.63
2:J:173:PRO:HD2	2:J:177:LEU:HD11	1.80	0.63
2:D:42:GLN:HE22	2:D:128:ARG:NH2	1.97	0.62
2:H:438:GLY:HA2	2:H:441:ILE:HD12	1.80	0.62
2:N:374:VAL:HG22	2:N:396:VAL:HB	1.78	0.62
2:O:50:ALA:O	2:O:54:ILE:HG13	1.99	0.62
2:O:166:MET:HB2	2:O:396:VAL:HG22	1.81	0.62
2:C:199:ASP:OD1	2:C:235:HIS:NE2	2.33	0.62
1:L:58:TRP:HD1	1:L:59:LYS:HG3	1.64	0.62
2:N:317:LEU:HD23	2:N:368:MET:HE1	1.82	0.62
1:E:17:TYR:CE2	2:H:418:ARG:HG2	2.34	0.62
1:E:97:GLN:NE2	2:J:181:ASN:OD1	2.33	0.62
1:F:13:GLU:CD	1:F:14:THR:H	2.07	0.62
1:F:58:TRP:CD1	1:F:59:LYS:HG3	2.35	0.62
2:H:117:ILE:HG22	2:H:118:VAL:HG13	1.82	0.62
1:B:17:TYR:CE2	2:C:418:ARG:HG2	2.33	0.62
2:K:133:GLU:OE1	2:K:309:ARG:NH1	2.30	0.62
2:O:133:GLU:OE1	2:O:309:ARG:NH1	2.33	0.61
2:J:133:GLU:OE1	2:J:309:ARG:NH1	2.30	0.61
2:J:438:GLY:HA2	2:J:441:ILE:HD12	1.82	0.61
1:B:18:LEU:HD12	1:B:19:PRO:CD	2.31	0.61
2:H:350:HIS:ND1	2:H:364:ASP:OD1	2.34	0.61
2:H:317:LEU:HD23	2:H:368:MET:HE1	1.82	0.61
1:B:58:TRP:CH2	1:B:78:CYS:HA	2.36	0.61
2:C:125:LYS:HZ1	2:D:333:GLU:N	1.99	0.60
2:G:469:MET:HE2	2:G:469:MET:HA	1.81	0.60
2:C:40:SER:OG	2:C:129:SER:OG	2.19	0.60
2:G:16:ASP:HB2	2:G:19:LEU:HD23	1.83	0.60
2:D:350:HIS:ND1	2:D:364:ASP:OD1	2.34	0.60
2:K:418:ARG:HG2	1:P:17:TYR:CE2	2.33	0.60
1:L:29:GLN:HE22	2:O:429:ASN:ND2	1.97	0.60
2:O:345:LEU:HA	2:O:351:ILE:HD13	1.82	0.60
1:E:87:ILE:HB	1:E:106:HIS:HB3	1.82	0.60
2:G:350:HIS:ND1	2:G:364:ASP:OD1	2.35	0.60
2:J:317:LEU:HD23	2:J:368:MET:HE1	1.83	0.60
2:D:317:LEU:HD23	2:D:368:MET:HE1	1.83	0.60
1:I:17:TYR:OH	2:J:418:ARG:NH1	2.35	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:240:THR:OG1	2:C:265:ASP:OD1	2.19	0.60
1:I:45:ASN:HD22	1:I:55:TRP:CG	2.20	0.60
2:J:350:HIS:ND1	2:J:364:ASP:OD1	2.35	0.60
2:C:438:GLY:HA2	2:C:441:ILE:HD12	1.84	0.59
2:N:350:HIS:ND1	2:N:364:ASP:OD1	2.35	0.59
2:K:237:LEU:HD11	2:K:259:MET:HE2	1.84	0.59
1:A:33:MET:SD	1:A:101:VAL:HG11	2.42	0.59
2:G:425:VAL:O	2:G:429:ASN:HB2	2.01	0.59
2:D:166:MET:HB2	2:D:396:VAL:HG22	1.84	0.59
2:G:290:ILE:HG21	2:G:315:LEU:HD11	1.83	0.59
2:G:438:GLY:HA2	2:G:441:ILE:HD12	1.84	0.59
2:C:317:LEU:HD23	2:C:368:MET:HE1	1.85	0.59
2:K:317:LEU:HD23	2:K:368:MET:HE1	1.85	0.59
2:K:292:ARG:HH11	2:K:324:HIS:HB3	1.68	0.59
2:D:438:GLY:HA2	2:D:441:ILE:HD12	1.84	0.59
2:H:197:THR:OG1	2:H:235:HIS:ND1	2.36	0.59
2:O:324:HIS:HA	2:O:374:VAL:HG12	1.83	0.59
2:G:190:LEU:HD22	2:G:233:LYS:HD2	1.85	0.58
2:K:350:HIS:ND1	2:K:364:ASP:OD1	2.36	0.58
2:D:123:GLY:O	2:D:125:LYS:NZ	2.36	0.58
2:C:261:ILE:HG13	2:C:287:LEU:HB2	1.84	0.58
2:O:350:HIS:ND1	2:O:364:ASP:OD1	2.36	0.58
2:O:317:LEU:HD23	2:O:368:MET:HE1	1.85	0.58
2:K:199:ASP:OD1	2:K:235:HIS:NE2	2.36	0.58
2:C:175:LEU:HD21	2:C:202:ASN:HB3	1.86	0.58
2:G:117:ILE:HG22	2:G:118:VAL:HG13	1.86	0.58
2:K:42:GLN:OE1	2:K:126:ALA:HA	2.04	0.58
2:C:345:LEU:HA	2:C:351:ILE:HD13	1.86	0.58
2:H:261:ILE:HG13	2:H:287:LEU:HB2	1.85	0.58
1:M:18:LEU:HD23	1:M:19:PRO:O	2.04	0.58
2:D:205:SER:OG	2:D:210:ARG:NH1	2.36	0.57
2:H:175:LEU:HD13	2:H:208:PHE:HZ	1.69	0.57
2:J:170:THR:HG22	2:J:198:LYS:HD3	1.87	0.57
2:J:240:THR:OG1	2:J:265:ASP:OD1	2.22	0.57
2:O:167:LEU:HD22	2:O:399:PHE:HE2	1.69	0.57
2:C:134:ASP:OD1	2:C:135:ILE:N	2.37	0.57
2:J:345:LEU:HA	2:J:351:ILE:HD13	1.85	0.57
2:N:240:THR:OG1	2:N:265:ASP:OD1	2.21	0.57
2:K:345:LEU:HA	2:K:351:ILE:HD13	1.85	0.57
2:D:155:GLU:HG3	2:D:287:LEU:HD22	1.87	0.57
2:D:442:LEU:HB3	2:D:456:LEU:HD11	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:317:LEU:HD23	2:G:368:MET:HE1	1.86	0.57
2:J:167:LEU:HD21	2:J:421:LEU:HD22	1.86	0.57
1:F:33:MET:HE1	1:F:101:VAL:HB	1.86	0.57
2:G:345:LEU:HA	2:G:351:ILE:HD13	1.86	0.57
1:L:93:ASP:OD2	1:L:96:LYS:HG3	2.05	0.56
1:B:33:MET:HE1	1:B:101:VAL:HB	1.87	0.56
2:G:134:ASP:OD1	2:G:135:ILE:N	2.38	0.56
2:N:292:ARG:HH11	2:N:324:HIS:HB3	1.70	0.56
2:D:134:ASP:OD1	2:D:135:ILE:N	2.38	0.56
2:H:139:VAL:HA	2:H:142:VAL:HG12	1.87	0.56
1:I:93:ASP:OD2	1:I:96:LYS:HG3	2.05	0.56
2:N:107:GLU:HB3	2:N:144:THR:HG21	1.87	0.56
2:H:42:GLN:OE1	2:H:126:ALA:HA	2.05	0.56
2:H:199:ASP:OD2	2:H:214:ARG:NH1	2.39	0.56
2:J:331:LYS:NZ	2:K:57:GLU:OE2	2.33	0.56
2:N:173:PRO:HD2	2:N:177:LEU:HD11	1.88	0.56
1:F:97:GLN:NE2	2:N:181:ASN:OD1	2.38	0.56
2:N:345:LEU:HA	2:N:351:ILE:HD13	1.88	0.56
2:H:205:SER:OG	2:H:210:ARG:NH1	2.38	0.56
2:O:51:GLY:HA2	2:O:54:ILE:HD12	1.88	0.56
2:N:134:ASP:OD1	2:N:135:ILE:N	2.38	0.56
2:H:134:ASP:OD1	2:H:135:ILE:N	2.39	0.56
1:B:58:TRP:HE1	1:B:59:LYS:NZ	2.03	0.55
2:H:425:VAL:O	2:H:429:ASN:HB2	2.06	0.55
2:J:166:MET:HB2	2:J:396:VAL:HG22	1.86	0.55
2:J:290:ILE:HG21	2:J:315:LEU:HD21	1.87	0.55
2:G:155:GLU:HG3	2:G:287:LEU:HD22	1.89	0.55
2:J:134:ASP:OD1	2:J:135:ILE:N	2.38	0.55
1:M:86:TYR:OH	1:M:107:ARG:NH1	2.39	0.55
2:O:134:ASP:OD1	2:O:135:ILE:N	2.39	0.55
1:B:97:GLN:HE21	2:O:178:SER:HB3	1.72	0.55
2:G:205:SER:OG	2:G:210:ARG:NH1	2.39	0.55
2:K:134:ASP:OD1	2:K:135:ILE:N	2.39	0.55
2:K:167:LEU:HD21	2:K:421:LEU:HD22	1.89	0.55
2:J:42:GLN:OE1	2:J:126:ALA:HA	2.06	0.55
2:G:406:HIS:HD2	2:G:408:TRP:H	1.54	0.55
2:J:197:THR:OG1	2:J:235:HIS:ND1	2.39	0.55
2:K:166:MET:HB2	2:K:396:VAL:HG22	1.86	0.55
1:M:17:TYR:CE2	2:N:418:ARG:HG2	2.42	0.55
2:N:198:LYS:HE3	2:N:263:MET:HE1	1.88	0.55
2:O:107:GLU:HB3	2:O:144:THR:HG21	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:345:LEU:HD12	2:D:351:ILE:HD13	1.88	0.55
2:G:199:ASP:OD1	2:G:235:HIS:NE2	2.40	0.54
1:A:14:THR:HG22	1:A:15:PHE:CD2	2.42	0.54
2:C:342:PHE:HA	2:C:345:LEU:HB2	1.88	0.54
2:G:173:PRO:HD2	2:G:177:LEU:HD11	1.90	0.54
1:B:14:THR:HG22	1:B:15:PHE:CD2	2.42	0.54
2:C:54:ILE:HG23	2:C:121:VAL:HG11	1.89	0.54
2:D:201:GLU:H	2:D:201:GLU:CD	2.14	0.54
2:K:173:PRO:HD2	2:K:177:LEU:HD11	1.89	0.54
2:H:345:LEU:HD12	2:H:351:ILE:HD13	1.89	0.54
1:I:41:LEU:HD13	1:I:61:PRO:HG3	1.89	0.54
2:D:442:LEU:HD12	2:D:456:LEU:HD12	1.90	0.54
2:K:54:ILE:HG23	2:K:121:VAL:HG11	1.89	0.54
2:N:139:VAL:HA	2:N:142:VAL:HG12	1.89	0.54
1:P:14:THR:HG22	1:P:15:PHE:CD2	2.43	0.54
2:K:155:GLU:HG3	2:K:287:LEU:HD22	1.90	0.54
2:K:240:THR:OG1	2:K:265:ASP:OD1	2.25	0.54
1:P:58:TRP:CD1	1:P:59:LYS:HE2	2.43	0.54
2:G:139:VAL:HA	2:G:142:VAL:HG12	1.89	0.54
2:K:327:THR:O	2:K:329:VAL:N	2.40	0.54
2:N:166:MET:HB2	2:N:396:VAL:HG22	1.88	0.54
2:G:342:PHE:HA	2:G:345:LEU:HB2	1.89	0.54
1:B:43:GLU:OE1	1:B:88:ARG:NE	2.39	0.53
1:M:14:THR:HG22	1:M:15:PHE:HD2	1.72	0.53
2:H:340:LEU:HB3	2:H:357:ARG:HH21	1.73	0.53
2:H:345:LEU:HA	2:H:351:ILE:HD13	1.89	0.53
2:J:175:LEU:HD12	2:K:104:LEU:HD12	1.91	0.53
2:J:241:ALA:HB1	2:J:246:GLU:HB3	1.89	0.53
2:C:166:MET:HB2	2:C:396:VAL:HG22	1.89	0.53
2:C:442:LEU:HB3	2:C:456:LEU:HD11	1.89	0.53
1:E:29:GLN:OE1	2:H:429:ASN:ND2	2.42	0.53
2:H:51:GLY:HA2	2:H:54:ILE:HD12	1.91	0.53
2:K:107:GLU:HB3	2:K:144:THR:HG21	1.91	0.53
2:C:327:THR:O	2:C:329:VAL:N	2.40	0.53
2:H:15:LYS:NZ	2:H:19:LEU:HB3	2.24	0.53
2:O:292:ARG:HH11	2:O:324:HIS:HB3	1.73	0.53
2:H:442:LEU:HB3	2:H:456:LEU:HD11	1.90	0.53
2:C:139:VAL:HA	2:C:142:VAL:HG12	1.89	0.53
2:D:393:ASP:OD1	2:D:428:ARG:NH1	2.37	0.53
1:E:30:ILE:O	1:E:34:ILE:HG23	2.09	0.53
2:H:327:THR:O	2:H:329:VAL:N	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:139:VAL:HA	2:K:142:VAL:HG12	1.89	0.53
1:M:29:GLN:OE1	2:N:429:ASN:ND2	2.41	0.53
2:O:173:PRO:HD2	2:O:177:LEU:HD11	1.91	0.53
2:C:340:LEU:HB3	2:C:357:ARG:HH21	1.73	0.53
2:D:57:GLU:HG3	2:D:124:PHE:CE1	2.44	0.53
2:H:107:GLU:HB3	2:H:144:THR:HG21	1.90	0.53
2:K:241:ALA:HB1	2:K:246:GLU:HB3	1.90	0.53
2:C:239:VAL:HG21	2:C:262:ILE:HD12	1.91	0.52
2:D:197:THR:OG1	2:D:235:HIS:ND1	2.29	0.52
1:P:43:GLU:OE1	1:P:88:ARG:NE	2.38	0.52
2:D:139:VAL:HA	2:D:142:VAL:HG12	1.90	0.52
2:H:155:GLU:HG3	2:H:287:LEU:HD22	1.90	0.52
2:O:436:ARG:NH1	2:O:436:ARG:HG3	2.24	0.52
1:B:58:TRP:HD1	1:B:59:LYS:HG3	1.74	0.52
2:C:167:LEU:HD21	2:C:421:LEU:HD22	1.90	0.52
2:D:327:THR:O	2:D:329:VAL:N	2.41	0.52
2:J:231:GLU:OE2	2:J:232:ILE:N	2.42	0.52
2:J:300:ARG:NH2	2:K:124:PHE:O	2.42	0.52
2:G:22:TYR:HE1	2:G:84:ILE:HD13	1.74	0.52
2:J:23:THR:O	2:J:23:THR:OG1	2.28	0.52
1:P:12:PHE:HD2	1:P:107:ARG:HH21	1.57	0.52
2:G:393:ASP:OD1	2:G:428:ARG:NH1	2.33	0.52
2:O:139:VAL:HA	2:O:142:VAL:HG12	1.91	0.52
1:P:58:TRP:HD1	1:P:59:LYS:HG3	1.75	0.52
2:C:197:THR:OG1	2:C:235:HIS:ND1	2.30	0.52
2:J:139:VAL:HA	2:J:142:VAL:HG12	1.91	0.52
2:N:57:GLU:OE2	2:O:331:LYS:NZ	2.35	0.52
2:C:190:LEU:HD22	2:C:233:LYS:HZ3	1.74	0.52
2:O:167:LEU:HD21	2:O:421:LEU:HD22	1.92	0.52
1:E:18:LEU:HD13	1:E:19:PRO:HD2	1.92	0.52
2:G:167:LEU:HD21	2:G:421:LEU:HD22	1.92	0.52
2:H:282:ARG:NH1	2:J:210:ARG:HD2	2.25	0.52
1:I:14:THR:HG22	1:I:15:PHE:CD2	2.45	0.52
1:L:41:LEU:HD13	1:L:61:PRO:HG3	1.91	0.52
2:O:197:THR:OG1	2:O:235:HIS:ND1	2.33	0.52
2:O:261:ILE:HG13	2:O:287:LEU:HB2	1.92	0.52
2:C:300:ARG:NH2	2:D:124:PHE:O	2.42	0.51
2:H:173:PRO:HD2	2:H:177:LEU:HD11	1.91	0.51
2:J:327:THR:O	2:J:329:VAL:N	2.41	0.51
1:L:84:ASP:OD1	1:L:84:ASP:N	2.37	0.51
2:O:123:GLY:O	2:O:125:LYS:NZ	2.44	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:117:ILE:HG22	2:D:118:VAL:HG13	1.92	0.51
1:E:28:ALA:O	1:E:31:GLU:HG3	2.10	0.51
1:P:14:THR:HG22	1:P:15:PHE:HD2	1.74	0.51
1:B:14:THR:HG22	1:B:15:PHE:HD2	1.75	0.51
2:C:167:LEU:HD22	2:C:399:PHE:HE2	1.75	0.51
2:G:437:GLU:O	2:G:441:ILE:HG13	2.10	0.51
2:J:107:GLU:HB3	2:J:144:THR:HG21	1.93	0.51
1:L:30:ILE:O	1:L:34:ILE:HG23	2.09	0.51
2:N:169:CYS:SG	2:N:197:THR:HG22	2.50	0.51
2:J:15:LYS:C	2:J:15:LYS:HD2	2.36	0.51
2:D:175:LEU:HD21	2:D:202:ASN:HD21	1.76	0.51
2:N:231:GLU:OE2	2:N:232:ILE:N	2.43	0.51
1:P:32:TYR:CE1	1:P:36:GLN:NE2	2.79	0.51
2:G:84:ILE:HD12	2:G:84:ILE:N	2.26	0.51
2:K:261:ILE:HG13	2:K:287:LEU:HB2	1.93	0.51
2:N:146:GLN:HE22	2:N:282:ARG:NH1	2.08	0.51
1:P:33:MET:SD	1:P:101:VAL:HG11	2.50	0.51
2:N:345:LEU:HD12	2:N:351:ILE:HD13	1.93	0.51
2:O:436:ARG:HG3	2:O:436:ARG:HH11	1.75	0.51
2:C:300:ARG:NE	2:C:333:GLU:OE1	2.44	0.51
2:J:54:ILE:HG22	2:J:98:ILE:HD11	1.92	0.51
1:P:41:LEU:HD13	1:P:61:PRO:HG3	1.93	0.51
1:F:30:ILE:O	1:F:34:ILE:HG23	2.12	0.50
2:G:442:LEU:HB3	2:G:456:LEU:HD11	1.92	0.50
2:N:292:ARG:HE	2:N:295:HIS:CE1	2.29	0.50
2:J:340:LEU:HB3	2:J:357:ARG:HH21	1.75	0.50
2:K:168:GLY:HA3	2:K:398:GLN:HG2	1.93	0.50
2:O:241:ALA:HB1	2:O:246:GLU:HB3	1.93	0.50
2:N:42:GLN:OE1	2:N:126:ALA:HA	2.10	0.50
2:N:167:LEU:HD21	2:N:421:LEU:HD22	1.93	0.50
1:E:38:PHE:HA	1:E:92:PHE:O	2.12	0.50
1:F:41:LEU:HD13	1:F:61:PRO:HG3	1.93	0.50
1:A:59:LYS:O	1:A:60:LEU:HD23	2.12	0.50
1:F:58:TRP:CH2	1:F:78:CYS:HA	2.46	0.50
2:J:91:GLU:N	2:J:91:GLU:OE1	2.44	0.50
2:G:327:THR:O	2:G:329:VAL:N	2.42	0.50
2:O:189:CYS:SG	2:O:194:LEU:HD12	2.51	0.50
2:C:107:GLU:HB3	2:C:144:THR:HG21	1.94	0.50
2:H:167:LEU:HD22	2:H:399:PHE:HE2	1.77	0.50
2:N:292:ARG:HG2	2:N:324:HIS:HB2	1.93	0.50
2:O:327:THR:O	2:O:329:VAL:N	2.43	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:365:TRP:HA	2:D:365:TRP:CE3	2.47	0.50
2:H:81:CYS:SG	2:H:84:ILE:HD11	2.52	0.50
1:A:41:LEU:HD13	1:A:61:PRO:HG3	1.93	0.50
2:H:167:LEU:HD21	2:H:421:LEU:HD22	1.92	0.50
1:P:84:ASP:OD1	1:P:84:ASP:N	2.40	0.50
1:B:33:MET:CE	1:B:101:VAL:HB	2.42	0.49
1:B:41:LEU:HD13	1:B:61:PRO:HG3	1.94	0.49
1:F:33:MET:CE	1:F:101:VAL:HB	2.41	0.49
2:G:167:LEU:HD22	2:G:399:PHE:HE2	1.77	0.49
2:H:231:GLU:OE2	2:H:232:ILE:N	2.44	0.49
2:N:241:ALA:HB1	2:N:246:GLU:HB3	1.94	0.49
2:J:174:LYS:HB3	2:J:174:LYS:HZ3	1.77	0.49
2:K:422:GLU:OE1	1:P:18:LEU:HD21	2.13	0.49
1:L:29:GLN:NE2	2:O:429:ASN:ND2	2.51	0.49
2:C:155:GLU:HG3	2:C:287:LEU:HD22	1.94	0.49
2:D:210:ARG:HD2	2:N:282:ARG:NH1	2.27	0.49
1:A:44:PHE:HA	1:A:86:TYR:O	2.12	0.49
2:C:445:ALA:HA	2:C:448:TRP:CZ3	2.47	0.49
2:K:429:ASN:OD1	1:P:32:TYR:HD2	1.96	0.49
2:N:157:ASP:HA	2:N:162:TYR:OH	2.12	0.49
1:A:58:TRP:CH2	1:A:78:CYS:HA	2.48	0.49
2:D:167:LEU:HD21	2:D:421:LEU:HD22	1.93	0.49
2:K:340:LEU:HB3	2:K:357:ARG:HH21	1.78	0.49
1:L:45:ASN:OD1	1:L:47:HIS:N	2.46	0.49
2:O:292:ARG:HE	2:O:295:HIS:CE1	2.31	0.49
1:B:36:GLN:OE1	1:B:36:GLN:HA	2.13	0.49
1:E:58:TRP:CH2	1:E:78:CYS:HA	2.47	0.49
2:C:40:SER:O	2:C:128:ARG:N	2.46	0.49
2:J:238:ASN:HA	2:J:263:MET:HG2	1.95	0.49
2:J:437:GLU:O	2:J:441:ILE:HG13	2.12	0.49
2:N:167:LEU:HD22	2:N:399:PHE:HE2	1.77	0.49
2:N:327:THR:O	2:N:329:VAL:N	2.44	0.49
2:O:239:VAL:HG21	2:O:262:ILE:HD12	1.95	0.49
2:H:213:ASP:OD1	2:H:213:ASP:N	2.45	0.49
1:M:84:ASP:OD1	1:M:84:ASP:N	2.39	0.49
1:A:84:ASP:OD2	1:A:108:PRO:HB3	2.13	0.49
1:E:58:TRP:HE1	1:E:59:LYS:NZ	2.11	0.49
1:F:17:TYR:HE2	2:G:418:ARG:CG	2.20	0.49
2:G:23:THR:O	2:G:23:THR:OG1	2.31	0.49
1:I:17:TYR:CZ	2:J:418:ARG:HG2	2.48	0.49
2:J:205:SER:OG	2:J:210:ARG:NH1	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:57:GLU:HG3	2:K:124:PHE:CE1	2.48	0.49
2:C:201:GLU:H	2:C:201:GLU:CD	2.19	0.49
2:C:354:ASP:OD1	2:C:356:SER:OG	2.30	0.49
1:E:50:PRO:HD2	1:E:51:GLU:CD	2.38	0.49
2:J:167:LEU:HD22	2:J:399:PHE:HE2	1.78	0.49
1:B:30:ILE:HD13	1:B:71:VAL:HB	1.94	0.48
1:I:30:ILE:O	1:I:34:ILE:HG23	2.13	0.48
2:K:422:GLU:CD	1:P:18:LEU:HD21	2.38	0.48
2:D:437:GLU:O	2:D:441:ILE:HG13	2.14	0.48
2:J:81:CYS:SG	2:J:84:ILE:HD11	2.52	0.48
1:F:13:GLU:OE1	1:F:14:THR:OG1	2.27	0.48
2:G:266:PHE:CZ	2:G:267:LEU:HG	2.49	0.48
2:H:300:ARG:NE	2:H:333:GLU:OE1	2.46	0.48
2:K:63:TRP:CE3	2:K:64:THR:OG1	2.67	0.48
2:O:40:SER:OG	2:O:129:SER:OG	2.19	0.48
2:D:189:CYS:SG	2:D:194:LEU:HD12	2.53	0.48
2:G:22:TYR:HE1	2:G:84:ILE:CD1	2.26	0.48
2:N:123:GLY:O	2:N:125:LYS:NZ	2.46	0.48
2:D:42:GLN:OE1	2:D:128:ARG:NH1	2.47	0.48
2:D:406:HIS:HD2	2:D:408:TRP:H	1.60	0.48
1:F:86:TYR:CZ	1:F:108:PRO:HG3	2.49	0.48
2:G:210:ARG:HD2	2:K:282:ARG:NH1	2.28	0.48
2:K:23:THR:O	2:K:23:THR:OG1	2.27	0.48
2:D:265:ASP:OD1	2:D:265:ASP:N	2.45	0.48
2:D:173:PRO:HD2	2:D:177:LEU:HD11	1.96	0.48
1:E:36:GLN:OE1	1:E:36:GLN:N	2.46	0.48
2:G:170:THR:HG22	2:G:198:LYS:HD3	1.95	0.48
2:H:166:MET:HB2	2:H:396:VAL:HG22	1.95	0.48
2:K:292:ARG:HG2	2:K:324:HIS:HB2	1.95	0.48
1:L:30:ILE:HD13	1:L:71:VAL:HB	1.95	0.48
2:D:345:LEU:HA	2:D:351:ILE:HD13	1.96	0.48
2:K:175:LEU:HD13	2:K:208:PHE:HZ	1.78	0.48
2:N:437:GLU:O	2:N:441:ILE:HG13	2.14	0.48
2:O:57:GLU:HG3	2:O:124:PHE:CE1	2.49	0.48
2:O:425:VAL:O	2:O:429:ASN:HB2	2.13	0.48
1:P:58:TRP:HE1	1:P:59:LYS:NZ	2.11	0.48
1:I:59:LYS:O	1:I:60:LEU:HD23	2.13	0.48
2:K:167:LEU:HB3	2:K:194:LEU:HD22	1.96	0.48
2:K:238:ASN:HA	2:K:263:MET:HG2	1.96	0.48
2:D:174:LYS:C	2:D:175:LEU:HD23	2.38	0.48
2:D:340:LEU:HB3	2:D:357:ARG:HH21	1.79	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:422:GLU:O	2:H:425:VAL:HG12	2.14	0.48
2:C:352:GLU:OE1	2:C:362:THR:OG1	2.30	0.47
2:H:237:LEU:HD11	2:H:259:MET:HE2	1.95	0.47
2:H:458:LEU:HD12	2:H:458:LEU:O	2.13	0.47
1:I:17:TYR:CE2	2:J:418:ARG:HG2	2.49	0.47
1:F:32:TYR:O	1:F:36:GLN:OE1	2.31	0.47
1:P:58:TRP:CH2	1:P:78:CYS:HA	2.49	0.47
1:B:30:ILE:O	1:B:33:MET:HB2	2.13	0.47
2:K:167:LEU:HD22	2:K:399:PHE:HE2	1.80	0.47
1:L:35:GLU:OE2	1:L:35:GLU:HA	2.14	0.47
1:M:59:LYS:O	1:M:60:LEU:HD23	2.14	0.47
2:G:54:ILE:HG23	2:G:121:VAL:HG11	1.97	0.47
1:I:43:GLU:OE1	1:I:88:ARG:NE	2.42	0.47
2:C:205:SER:OG	2:C:210:ARG:NH1	2.46	0.47
2:K:146:GLN:HE22	2:K:282:ARG:NH1	2.12	0.47
2:O:205:SER:OG	2:O:210:ARG:NH1	2.47	0.47
2:C:173:PRO:HD2	2:C:177:LEU:HD11	1.96	0.47
2:C:231:GLU:OE2	2:C:232:ILE:N	2.47	0.47
2:K:81:CYS:SG	2:K:84:ILE:HD11	2.54	0.47
1:L:58:TRP:CH2	1:L:78:CYS:HA	2.50	0.47
1:E:50:PRO:HD2	1:E:51:GLU:N	2.30	0.47
2:H:437:GLU:O	2:H:441:ILE:HG13	2.15	0.47
2:K:354:ASP:OD1	2:K:356:SER:OG	2.33	0.47
2:N:238:ASN:HA	2:N:263:MET:HG2	1.95	0.47
2:C:210:ARG:HD2	2:J:282:ARG:NH1	2.30	0.47
2:D:167:LEU:HD22	2:D:399:PHE:HE2	1.79	0.47
2:D:384:MET:HE1	2:D:399:PHE:CE1	2.50	0.47
2:D:54:ILE:HG22	2:D:98:ILE:HD11	1.96	0.46
2:D:340:LEU:HD23	2:D:340:LEU:HA	1.74	0.46
1:M:13:GLU:HB3	1:M:14:THR:H	1.53	0.46
2:O:422:GLU:O	2:O:425:VAL:HG12	2.15	0.46
1:P:30:ILE:HD13	1:P:71:VAL:HB	1.96	0.46
1:A:85:CYS:O	1:A:87:ILE:HG13	2.15	0.46
1:F:32:TYR:CD1	1:F:32:TYR:C	2.92	0.46
2:G:174:LYS:O	2:G:175:LEU:HD23	2.15	0.46
2:N:408:TRP:CD1	2:N:408:TRP:N	2.84	0.46
1:F:28:ALA:HA	1:F:31:GLU:OE1	2.14	0.46
2:G:261:ILE:HG13	2:G:287:LEU:CB	2.33	0.46
2:H:292:ARG:HE	2:H:295:HIS:CE1	2.34	0.46
1:I:14:THR:HG22	1:I:15:PHE:HD2	1.79	0.46
2:K:292:ARG:HH21	2:K:295:HIS:CE1	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:241:ALA:HB1	2:D:246:GLU:HB3	1.96	0.46
2:G:178:SER:N	1:P:97:GLN:OE1	2.48	0.46
2:J:354:ASP:OD1	2:J:356:SER:OG	2.34	0.46
2:N:340:LEU:HB3	2:N:357:ARG:HH21	1.80	0.46
2:O:197:THR:O	2:O:235:HIS:ND1	2.48	0.46
2:O:354:ASP:OD1	2:O:356:SER:OG	2.32	0.46
2:C:174:LYS:C	2:C:175:LEU:HD23	2.41	0.46
2:C:317:LEU:HD23	2:C:317:LEU:HA	1.80	0.46
2:D:458:LEU:HD12	2:D:458:LEU:O	2.15	0.46
2:G:236:TYR:HD1	2:G:261:ILE:CG2	2.29	0.46
1:B:38:PHE:CE2	1:B:93:ASP:HB2	2.51	0.46
2:C:125:LYS:HZ1	2:D:332:LEU:C	2.23	0.46
2:C:437:GLU:O	2:C:441:ILE:HG13	2.16	0.46
2:D:197:THR:O	2:D:235:HIS:ND1	2.49	0.46
2:K:123:GLY:O	2:K:125:LYS:NZ	2.49	0.46
2:O:37:PHE:CD1	2:O:130:LEU:HD21	2.51	0.46
2:C:124:PHE:O	2:D:300:ARG:NH2	2.49	0.46
2:C:331:LYS:NZ	2:D:57:GLU:OE2	2.35	0.46
2:D:168:GLY:HA3	2:D:398:GLN:HG2	1.97	0.46
2:H:387:LEU:HA	2:H:390:ILE:HD12	1.98	0.46
2:H:393:ASP:OD1	2:H:428:ARG:NH1	2.45	0.46
2:J:167:LEU:HB3	2:J:194:LEU:HD22	1.98	0.46
2:J:445:ALA:HA	2:J:448:TRP:CZ3	2.51	0.46
2:K:15:LYS:HE2	2:K:19:LEU:HD13	1.98	0.46
2:K:365:TRP:HA	2:K:365:TRP:CE3	2.50	0.46
1:M:59:LYS:HD2	1:M:59:LYS:HA	1.76	0.46
2:N:211:TRP:CE3	2:N:250:ARG:HD3	2.51	0.46
2:J:146:GLN:HE22	2:J:282:ARG:NH1	2.13	0.46
2:J:352:GLU:HA	2:J:352:GLU:OE1	2.16	0.46
2:J:384:MET:HE1	2:J:399:PHE:CE1	2.50	0.46
2:N:175:LEU:HD13	2:N:208:PHE:HZ	1.81	0.46
2:N:236:TYR:HD1	2:N:261:ILE:CG2	2.28	0.46
2:N:352:GLU:OE1	2:N:362:THR:OG1	2.29	0.46
1:P:30:ILE:O	1:P:34:ILE:HG23	2.16	0.46
2:D:387:LEU:HA	2:D:390:ILE:HD12	1.98	0.46
1:E:59:LYS:O	1:E:60:LEU:HD23	2.15	0.46
1:F:84:ASP:OD1	1:F:84:ASP:N	2.45	0.46
2:G:189:CYS:SG	2:G:194:LEU:HD12	2.56	0.46
2:H:190:LEU:HD12	2:H:233:LYS:CD	2.46	0.46
2:H:213:ASP:OD2	2:O:154:VAL:HG11	2.15	0.46
2:C:197:THR:O	2:C:235:HIS:ND1	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:197:THR:O	2:G:235:HIS:ND1	2.49	0.46
2:G:354:ASP:OD1	2:G:356:SER:OG	2.34	0.46
2:J:236:TYR:HD1	2:J:261:ILE:CG2	2.28	0.46
2:J:393:ASP:OD1	2:J:428:ARG:NH1	2.42	0.46
2:K:39:PHE:CE1	2:K:94:TYR:HB2	2.51	0.46
2:K:406:HIS:HD2	2:K:408:TRP:H	1.63	0.46
1:L:87:ILE:HD12	1:L:106:HIS:CD2	2.51	0.46
1:B:32:TYR:HD2	2:C:429:ASN:OD1	1.99	0.45
2:H:255:LYS:O	2:H:255:LYS:HD3	2.15	0.45
1:L:58:TRP:NE1	1:L:59:LYS:HZ3	2.14	0.45
1:A:29:GLN:OE1	2:D:429:ASN:ND2	2.50	0.45
2:D:57:GLU:HG3	2:D:124:PHE:HE1	1.80	0.45
2:D:231:GLU:OE1	2:D:232:ILE:N	2.50	0.45
1:P:59:LYS:O	1:P:60:LEU:HD23	2.15	0.45
2:D:299:ASP:C	2:D:299:ASP:OD1	2.59	0.45
1:F:38:PHE:HA	1:F:92:PHE:O	2.16	0.45
2:J:189:CYS:SG	2:J:194:LEU:HD12	2.57	0.45
2:J:299:ASP:OD1	2:J:299:ASP:C	2.60	0.45
1:F:18:LEU:HD21	2:G:422:GLU:CD	2.42	0.45
2:D:292:ARG:NH2	2:D:332:LEU:HD13	2.31	0.45
2:H:40:SER:OG	2:H:129:SER:OG	2.19	0.45
2:H:210:ARG:HD2	2:O:282:ARG:NH1	2.32	0.45
1:I:84:ASP:OD1	1:I:84:ASP:N	2.34	0.45
2:J:205:SER:O	2:K:106:GLU:HB2	2.17	0.45
2:K:169:CYS:HG	2:K:189:CYS:HG	1.64	0.45
2:K:200:ASP:OD1	2:K:201:GLU:N	2.49	0.45
2:O:300:ARG:NE	2:O:333:GLU:OE1	2.50	0.45
1:A:30:ILE:O	1:A:34:ILE:HG23	2.16	0.45
2:C:174:LYS:O	2:C:175:LEU:HD23	2.16	0.45
2:D:445:ALA:HA	2:D:448:TRP:CZ3	2.51	0.45
2:G:238:ASN:OD1	2:G:239:VAL:N	2.49	0.45
1:L:9:GLU:HB3	1:L:10:ARG:H	1.49	0.45
1:M:58:TRP:HD1	1:M:59:LYS:HB2	1.81	0.45
2:O:39:PHE:CE1	2:O:94:TYR:HB2	2.51	0.45
2:O:155:GLU:HG3	2:O:287:LEU:HD22	1.98	0.45
2:D:81:CYS:SG	2:D:84:ILE:HD11	2.57	0.45
2:G:167:LEU:HB3	2:G:194:LEU:HD22	1.99	0.45
2:G:317:LEU:HD23	2:G:317:LEU:HA	1.81	0.45
2:H:352:GLU:OE2	2:H:362:THR:OG1	2.31	0.45
1:I:51:GLU:OE2	2:J:226:GLN:NE2	2.49	0.45
2:D:107:GLU:HB3	2:D:144:THR:HG21	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:143:LYS:HA	2:D:143:LYS:HD3	1.73	0.45
1:E:32:TYR:CE2	2:H:429:ASN:HA	2.52	0.45
2:G:255:LYS:O	2:G:255:LYS:HD3	2.16	0.45
2:H:40:SER:O	2:H:128:ARG:N	2.50	0.45
2:J:255:LYS:HD3	2:J:255:LYS:O	2.17	0.45
1:P:38:PHE:CE2	1:P:93:ASP:HB2	2.51	0.45
2:D:238:ASN:OD1	2:D:239:VAL:N	2.50	0.45
1:F:11:ARG:NE	1:F:17:TYR:CE1	2.85	0.45
2:G:40:SER:OG	2:G:129:SER:OG	2.22	0.45
2:G:81:CYS:SG	2:G:84:ILE:HD11	2.57	0.45
2:H:292:ARG:HH11	2:H:324:HIS:HB3	1.81	0.45
2:J:114:LEU:O	2:J:118:VAL:HG12	2.17	0.45
2:K:387:LEU:HA	2:K:390:ILE:HD12	1.99	0.45
2:K:445:ALA:HA	2:K:448:TRP:CZ3	2.52	0.45
1:B:97:GLN:HE21	2:O:178:SER:CB	2.29	0.45
2:C:255:LYS:O	2:C:255:LYS:HD3	2.16	0.45
1:E:11:ARG:HD2	1:E:17:TYR:CE1	2.52	0.45
2:J:382:TRP:HE1	2:J:456:LEU:HB2	1.82	0.45
2:K:255:LYS:O	2:K:255:LYS:HD3	2.17	0.45
2:N:255:LYS:O	2:N:255:LYS:HD3	2.16	0.45
2:N:354:ASP:OD1	2:N:356:SER:OG	2.33	0.45
2:O:238:ASN:OD1	2:O:239:VAL:N	2.49	0.45
1:P:87:ILE:HD12	1:P:106:HIS:CD2	2.52	0.45
1:E:87:ILE:HD12	1:E:106:HIS:CD2	2.53	0.44
2:K:266:PHE:CZ	2:K:267:LEU:HG	2.53	0.44
2:N:197:THR:O	2:N:235:HIS:ND1	2.49	0.44
2:N:205:SER:O	2:O:106:GLU:HB2	2.17	0.44
2:O:69:ASP:HB3	2:O:74:MET:SD	2.58	0.44
2:D:84:ILE:N	2:D:84:ILE:HD12	2.33	0.44
2:G:299:ASP:OD1	2:G:299:ASP:C	2.61	0.44
2:H:74:MET:HE2	2:H:74:MET:HB3	1.80	0.44
2:N:168:GLY:HA3	2:N:398:GLN:HG2	2.00	0.44
2:O:114:LEU:O	2:O:118:VAL:HG12	2.16	0.44
1:B:59:LYS:HB2	1:B:60:LEU:H	1.53	0.44
2:C:282:ARG:NH1	2:O:210:ARG:HD2	2.32	0.44
2:C:367:SER:OG	2:N:103:ASP:OD2	2.25	0.44
2:G:166:MET:HB2	2:G:396:VAL:HG22	2.00	0.44
2:G:282:ARG:NH1	2:N:210:ARG:HD2	2.32	0.44
2:J:194:LEU:HD23	2:J:194:LEU:HA	1.80	0.44
2:N:23:THR:O	2:N:23:THR:OG1	2.28	0.44
2:N:39:PHE:CE1	2:N:94:TYR:HB2	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:O:292:ARG:HG2	2:O:324:HIS:HB2	2.00	0.44
2:O:387:LEU:HA	2:O:390:ILE:HD12	1.98	0.44
1:E:11:ARG:HD2	1:E:17:TYR:CD1	2.52	0.44
2:H:189:CYS:SG	2:H:194:LEU:HD12	2.57	0.44
2:H:316:ARG:HD3	2:H:365:TRP:CZ2	2.53	0.44
2:O:255:LYS:HD3	2:O:255:LYS:O	2.17	0.44
2:C:266:PHE:CZ	2:C:267:LEU:HG	2.52	0.44
2:D:255:LYS:O	2:D:255:LYS:HD3	2.17	0.44
2:J:112:ASN:C	2:J:112:ASN:ND2	2.75	0.44
2:K:429:ASN:HD21	1:P:29:GLN:CD	2.25	0.44
2:O:54:ILE:HG23	2:O:121:VAL:HG11	2.00	0.44
2:C:299:ASP:OD1	2:C:299:ASP:C	2.60	0.44
2:G:132:LEU:HD23	2:G:310:VAL:HG21	1.99	0.44
2:G:387:LEU:HA	2:G:390:ILE:HD12	2.00	0.44
2:H:190:LEU:HD12	2:H:233:LYS:HD3	1.99	0.44
2:H:408:TRP:CD1	2:H:408:TRP:N	2.86	0.44
2:K:57:GLU:HG3	2:K:124:PHE:HE1	1.83	0.44
2:K:299:ASP:OD1	2:K:299:ASP:C	2.61	0.44
1:L:59:LYS:O	1:L:60:LEU:HD23	2.17	0.44
2:N:37:PHE:CD1	2:N:130:LEU:HD21	2.53	0.44
2:N:266:PHE:CZ	2:N:267:LEU:HG	2.53	0.44
2:O:299:ASP:OD1	2:O:299:ASP:C	2.60	0.44
2:O:445:ALA:HA	2:O:448:TRP:CZ3	2.53	0.44
2:H:84:ILE:N	2:H:84:ILE:HD12	2.33	0.44
2:H:256:GLU:C	2:H:256:GLU:OE1	2.61	0.44
2:O:60:THR:O	2:O:60:THR:OG1	2.33	0.44
1:B:30:ILE:O	1:B:34:ILE:HG23	2.18	0.44
2:D:181:ASN:HD21	1:M:97:GLN:HE22	1.66	0.44
2:J:190:LEU:HD22	2:J:233:LYS:HD2	2.00	0.44
1:L:58:TRP:HE1	1:L:59:LYS:NZ	2.16	0.44
1:E:43:GLU:OE1	1:E:88:ARG:NE	2.39	0.44
2:G:71:LEU:O	2:G:71:LEU:HD12	2.18	0.44
2:H:23:THR:O	2:H:23:THR:OG1	2.33	0.44
2:H:445:ALA:HA	2:H:448:TRP:CZ3	2.53	0.44
2:J:118:VAL:HG21	2:J:306:ILE:HD11	2.00	0.44
2:N:315:LEU:HD13	2:N:323:LEU:HD11	2.00	0.44
2:O:469:MET:HA	2:O:469:MET:CE	2.39	0.44
2:G:239:VAL:HG21	2:G:262:ILE:HD12	2.00	0.43
2:H:299:ASP:OD1	2:H:299:ASP:C	2.61	0.43
2:J:39:PHE:CE1	2:J:94:TYR:HB2	2.53	0.43
2:J:197:THR:O	2:J:235:HIS:ND1	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:315:LEU:HD23	2:J:323:LEU:HD11	2.00	0.43
2:K:352:GLU:OE1	2:K:352:GLU:HA	2.18	0.43
1:L:32:TYR:CE2	2:O:429:ASN:OD1	2.71	0.43
2:O:235:HIS:HD2	2:O:237:LEU:HD23	1.83	0.43
1:B:81:GLU:HG3	1:B:82:TYR:CD1	2.53	0.43
1:E:58:TRP:HE1	1:E:59:LYS:HZ2	1.66	0.43
2:G:300:ARG:NE	2:G:333:GLU:OE1	2.51	0.43
2:H:238:ASN:OD1	2:H:239:VAL:N	2.51	0.43
2:H:382:TRP:NE1	2:H:456:LEU:HG	2.33	0.43
1:I:45:ASN:HD22	1:I:55:TRP:CD1	2.36	0.43
2:D:267:LEU:HD23	2:D:267:LEU:HA	1.82	0.43
2:D:387:LEU:HA	2:D:387:LEU:HD23	1.88	0.43
2:D:422:GLU:O	2:D:425:VAL:HG12	2.18	0.43
1:F:26:ILE:O	1:F:30:ILE:HG12	2.18	0.43
2:G:155:GLU:OE2	2:G:322:HIS:NE2	2.51	0.43
2:G:340:LEU:HB3	2:G:357:ARG:HH21	1.82	0.43
2:G:382:TRP:NE1	2:G:456:LEU:HG	2.32	0.43
2:K:83:HIS:HE1	2:K:85:GLU:OE1	2.02	0.43
2:K:384:MET:HE1	2:K:399:PHE:CE1	2.53	0.43
2:K:428:ARG:HB2	2:K:434:LEU:HD11	2.00	0.43
1:F:13:GLU:CD	1:F:14:THR:N	2.73	0.43
2:H:15:LYS:HD2	2:H:15:LYS:C	2.44	0.43
2:J:127:ILE:HD13	2:J:130:LEU:HD12	1.99	0.43
2:J:387:LEU:HA	2:J:390:ILE:HD12	2.00	0.43
2:O:174:LYS:NZ	2:O:200:ASP:OD2	2.41	0.43
1:B:54:TYR:OH	2:O:183:GLY:HA3	2.18	0.43
2:C:200:ASP:OD1	2:C:201:GLU:N	2.51	0.43
2:H:71:LEU:HD23	2:H:71:LEU:HA	1.84	0.43
1:M:58:TRP:CH2	1:M:78:CYS:HA	2.54	0.43
1:A:14:THR:HG22	1:A:15:PHE:HD2	1.82	0.43
2:C:74:MET:HE2	2:C:74:MET:HB3	1.94	0.43
2:D:114:LEU:HD23	2:D:114:LEU:HA	1.78	0.43
2:D:248:MET:HE1	2:D:280:TRP:CD1	2.53	0.43
2:H:168:GLY:HA2	2:H:196:PHE:O	2.19	0.43
2:K:300:ARG:NE	2:K:333:GLU:OE1	2.52	0.43
2:N:299:ASP:OD1	2:N:299:ASP:C	2.62	0.43
2:O:422:GLU:C	2:O:422:GLU:CD	2.86	0.43
2:G:268:THR:HG21	2:H:115:THR:OG1	2.19	0.43
2:J:60:THR:HA	2:K:174:LYS:HB2	2.01	0.43
2:J:83:HIS:HE1	2:J:85:GLU:OE1	2.02	0.43
2:K:442:LEU:HB3	2:K:456:LEU:HD11	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:114:LEU:O	2:N:118:VAL:HG12	2.18	0.43
2:N:198:LYS:HB3	2:N:236:TYR:CD2	2.53	0.43
2:N:205:SER:OG	2:N:210:ARG:NH1	2.52	0.43
1:P:58:TRP:NE1	1:P:59:LYS:HE2	2.33	0.43
2:H:15:LYS:HZ1	2:H:19:LEU:HB3	1.84	0.43
2:H:248:MET:HE1	2:H:280:TRP:CD1	2.54	0.43
2:K:429:ASN:OD1	1:P:32:TYR:CD2	2.72	0.43
2:N:125:LYS:HA	2:N:125:LYS:HD3	1.74	0.43
2:G:345:LEU:HD23	2:G:351:ILE:CD1	2.49	0.43
2:H:215:PHE:CE1	2:H:237:LEU:HB3	2.54	0.43
1:M:97:GLN:HA	1:M:97:GLN:OE1	2.18	0.43
2:N:167:LEU:HB3	2:N:194:LEU:HD22	2.00	0.43
2:O:437:GLU:O	2:O:441:ILE:HG13	2.18	0.43
2:G:174:LYS:HE2	2:G:174:LYS:HB3	1.70	0.43
2:G:183:GLY:HA3	1:P:54:TYR:OH	2.19	0.43
2:H:387:LEU:HA	2:H:387:LEU:HD23	1.88	0.43
2:J:405:GLY:HA2	2:K:66:VAL:HG12	2.00	0.43
2:K:292:ARG:NH2	2:K:332:LEU:HD13	2.28	0.43
1:M:30:ILE:O	1:M:34:ILE:HG23	2.18	0.43
2:O:317:LEU:HD23	2:O:317:LEU:HA	1.79	0.43
1:B:32:TYR:HE1	1:B:36:GLN:HG2	1.84	0.42
2:C:59:SER:OG	2:C:60:THR:HG22	2.19	0.42
2:C:365:TRP:HA	2:C:365:TRP:CE3	2.54	0.42
2:D:218:VAL:HG11	2:D:235:HIS:CD2	2.54	0.42
2:G:198:LYS:HE3	2:G:263:MET:HE1	2.01	0.42
2:J:300:ARG:NE	2:J:333:GLU:OE1	2.52	0.42
2:K:194:LEU:HD23	2:K:194:LEU:HA	1.82	0.42
2:N:37:PHE:CE1	2:N:132:LEU:HD12	2.53	0.42
2:O:84:ILE:HD12	2:O:84:ILE:N	2.33	0.42
2:O:125:LYS:HA	2:O:125:LYS:HD3	1.76	0.42
2:G:124:PHE:O	2:H:300:ARG:NH2	2.51	0.42
2:H:266:PHE:CZ	2:H:267:LEU:HG	2.54	0.42
1:I:93:ASP:OD1	1:I:94:ASN:N	2.52	0.42
1:I:97:GLN:O	1:I:97:GLN:OE1	2.36	0.42
2:J:215:PHE:CE1	2:J:237:LEU:HB3	2.54	0.42
2:J:218:VAL:HG11	2:J:235:HIS:CD2	2.54	0.42
2:K:215:PHE:CE1	2:K:237:LEU:HB3	2.54	0.42
2:N:155:GLU:HG3	2:N:287:LEU:HD22	2.01	0.42
2:C:241:ALA:HB1	2:C:246:GLU:HB3	2.01	0.42
2:D:215:PHE:CE1	2:D:237:LEU:HB3	2.54	0.42
2:G:26:TYR:OH	2:G:32:ASP:OD2	2.35	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:18:LEU:HD23	2:J:422:GLU:OE2	2.19	0.42
2:N:59:SER:HB2	2:N:104:LEU:HD21	2.01	0.42
2:O:215:PHE:CE1	2:O:237:LEU:HB3	2.54	0.42
2:H:60:THR:O	2:H:60:THR:OG1	2.38	0.42
2:H:428:ARG:HB2	2:H:434:LEU:HD11	2.02	0.42
1:I:38:PHE:HA	1:I:92:PHE:O	2.19	0.42
2:J:174:LYS:O	2:J:175:LEU:HD23	2.20	0.42
2:J:231:GLU:CD	2:J:232:ILE:N	2.77	0.42
1:M:62:LEU:HD12	1:M:71:VAL:HG22	2.01	0.42
2:D:71:LEU:HA	2:D:71:LEU:HD23	1.87	0.42
2:G:22:TYR:CE1	2:G:84:ILE:HD13	2.51	0.42
1:B:28:ALA:HA	1:B:31:GLU:OE1	2.18	0.42
2:C:267:LEU:HD23	2:C:267:LEU:HA	1.86	0.42
2:C:387:LEU:HA	2:C:390:ILE:HD12	2.02	0.42
2:C:387:LEU:HA	2:C:387:LEU:HD23	1.88	0.42
2:D:340:LEU:HD13	2:D:357:ARG:NH2	2.34	0.42
2:G:428:ARG:HB2	2:G:434:LEU:HD21	2.02	0.42
2:H:39:PHE:CE1	2:H:94:TYR:HB2	2.53	0.42
2:H:183:GLY:HA3	1:L:54:TYR:OH	2.18	0.42
1:M:49:ASN:N	1:M:52:GLU:OE2	2.50	0.42
2:N:387:LEU:HA	2:N:390:ILE:HD12	2.00	0.42
1:A:84:ASP:CG	1:A:85:CYS:H	2.26	0.42
2:G:39:PHE:CE1	2:G:94:TYR:HB2	2.55	0.42
2:J:155:GLU:HG3	2:J:287:LEU:HD22	2.02	0.42
2:K:197:THR:O	2:K:235:HIS:ND1	2.52	0.42
1:M:14:THR:HG22	1:M:15:PHE:CD2	2.54	0.42
2:D:40:SER:OG	2:D:129:SER:OG	2.21	0.42
2:D:174:LYS:O	2:D:175:LEU:HD23	2.20	0.42
2:D:190:LEU:HD22	2:D:233:LYS:HD3	2.02	0.42
1:F:38:PHE:CE2	1:F:93:ASP:HB2	2.54	0.42
1:F:54:TYR:OH	2:N:183:GLY:HA3	2.20	0.42
2:D:248:MET:HE1	2:D:280:TRP:CG	2.55	0.42
2:G:387:LEU:HA	2:G:387:LEU:HD23	1.88	0.42
2:H:15:LYS:HZ3	2:H:19:LEU:HD22	1.85	0.42
2:H:235:HIS:HD2	2:H:237:LEU:HD23	1.85	0.42
2:J:273:ALA:O	2:J:276:THR:HG22	2.20	0.42
2:J:408:TRP:N	2:J:408:TRP:CD1	2.86	0.42
1:A:54:TYR:OH	2:K:183:GLY:HA3	2.20	0.42
2:D:266:PHE:CZ	2:D:267:LEU:HG	2.55	0.42
2:D:425:VAL:O	2:D:429:ASN:HB2	2.20	0.42
2:G:188:GLU:OE2	1:P:57:MET:HE2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:31:THR:HG22	2:H:102:LEU:HB2	2.02	0.42
2:H:54:ILE:HG23	2:H:121:VAL:HG11	2.01	0.42
1:L:48:SER:O	1:L:48:SER:OG	2.37	0.42
2:N:407:PRO:HG2	2:N:408:TRP:CD1	2.55	0.42
2:D:281:CYS:SG	2:D:286:VAL:HG23	2.60	0.41
1:F:14:THR:HG23	2:G:164:ARG:HD3	2.02	0.41
1:F:36:GLN:HB2	1:F:38:PHE:CE1	2.55	0.41
2:K:345:LEU:HD12	2:K:351:ILE:HD13	2.01	0.41
2:D:282:ARG:NH1	2:K:210:ARG:HG2	2.35	0.41
1:E:32:TYR:HE2	2:H:429:ASN:HA	1.85	0.41
1:F:17:TYR:OH	2:G:418:ARG:NH1	2.53	0.41
2:H:422:GLU:CD	2:H:422:GLU:C	2.87	0.41
2:J:317:LEU:HD23	2:J:317:LEU:HA	1.81	0.41
1:M:43:GLU:OE1	1:M:88:ARG:NE	2.39	0.41
2:N:384:MET:HE1	2:N:399:PHE:CE1	2.55	0.41
2:N:419:VAL:HG12	2:N:452:LEU:HD22	2.02	0.41
1:A:32:TYR:CD1	1:A:32:TYR:C	2.98	0.41
2:C:170:THR:HG22	2:C:198:LYS:HD3	2.03	0.41
2:D:183:GLY:HA3	1:M:54:TYR:OH	2.21	0.41
2:H:241:ALA:HB1	2:H:246:GLU:HB3	2.01	0.41
2:J:248:MET:HE1	2:J:280:TRP:CD1	2.55	0.41
2:J:316:ARG:HD3	2:J:365:TRP:CZ2	2.55	0.41
2:N:235:HIS:HD2	2:N:237:LEU:HD23	1.86	0.41
2:C:85:GLU:HG2	2:C:86:PRO:HD2	2.02	0.41
2:D:317:LEU:HD23	2:D:317:LEU:HA	1.81	0.41
1:F:59:LYS:C	1:F:60:LEU:HD23	2.45	0.41
2:H:251:ALA:HB1	2:H:280:TRP:CZ3	2.55	0.41
2:K:236:TYR:CE1	2:K:261:ILE:HD13	2.55	0.41
1:L:36:GLN:HB2	1:L:38:PHE:CE2	2.56	0.41
2:C:183:GLY:HA3	1:I:54:TYR:OH	2.20	0.41
1:I:28:ALA:HA	1:I:31:GLU:OE1	2.20	0.41
2:J:15:LYS:HZ2	2:J:17:TYR:HA	1.85	0.41
2:N:215:PHE:CE1	2:N:237:LEU:HB3	2.55	0.41
2:N:445:ALA:HA	2:N:448:TRP:CZ3	2.55	0.41
2:O:251:ALA:HB1	2:O:280:TRP:CZ3	2.56	0.41
1:A:15:PHE:HE1	2:D:426:GLN:HB2	1.85	0.41
1:A:84:ASP:CG	1:A:85:CYS:N	2.75	0.41
2:C:268:THR:HG21	2:D:115:THR:OG1	2.21	0.41
2:C:426:GLN:HA	2:C:429:ASN:HB2	2.03	0.41
2:D:40:SER:HA	2:D:41:PRO:HD3	1.95	0.41
2:D:74:MET:HE2	2:D:74:MET:HB3	1.91	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:251:ALA:HB1	2:D:280:TRP:CZ3	2.55	0.41
2:G:323:LEU:HB3	2:G:346:MET:HE1	2.02	0.41
2:G:422:GLU:O	2:G:425:VAL:HG12	2.20	0.41
2:G:458:LEU:HD12	2:G:458:LEU:O	2.20	0.41
2:H:175:LEU:HD13	2:H:208:PHE:CZ	2.54	0.41
2:H:248:MET:HE1	2:H:280:TRP:CG	2.56	0.41
1:M:58:TRP:CD1	1:M:58:TRP:C	2.99	0.41
2:O:81:CYS:SG	2:O:84:ILE:HD11	2.60	0.41
2:C:323:LEU:HB3	2:C:346:MET:HE1	2.03	0.41
2:G:178:SER:HB3	1:P:97:GLN:HG2	2.02	0.41
2:H:186:VAL:HG13	2:H:190:LEU:HD23	2.03	0.41
2:K:382:TRP:CE2	2:K:456:LEU:HD22	2.56	0.41
1:L:58:TRP:HE1	1:L:59:LYS:HZ3	1.69	0.41
2:O:74:MET:HE2	2:O:74:MET:HB3	1.94	0.41
2:D:167:LEU:HB3	2:D:194:LEU:HD22	2.02	0.41
1:I:29:GLN:HE22	2:J:429:ASN:HD21	1.68	0.41
2:J:266:PHE:CZ	2:J:267:LEU:HG	2.56	0.41
1:L:33:MET:HE2	1:L:33:MET:HB2	1.97	0.41
2:N:74:MET:HE2	2:N:74:MET:HB3	1.94	0.41
2:O:350:HIS:NE2	2:O:352:GLU:OE1	2.47	0.41
1:B:38:PHE:HA	1:B:92:PHE:O	2.20	0.41
2:C:231:GLU:O	2:C:233:LYS:HG2	2.21	0.41
2:D:39:PHE:CE1	2:D:94:TYR:HB2	2.55	0.41
2:D:42:GLN:HE22	2:D:128:ARG:CZ	2.33	0.41
2:G:37:PHE:CE1	2:G:132:LEU:HD12	2.56	0.41
2:G:266:PHE:HB3	2:G:290:ILE:HG23	2.02	0.41
2:H:125:LYS:HA	2:H:125:LYS:HD3	1.77	0.41
2:H:442:LEU:HD12	2:H:456:LEU:HD12	2.03	0.41
1:I:29:GLN:OE1	2:J:429:ASN:CG	2.64	0.41
2:J:37:PHE:CE1	2:J:132:LEU:HD12	2.56	0.41
2:J:112:ASN:ND2	2:J:112:ASN:O	2.54	0.41
2:J:315:LEU:HD12	2:J:315:LEU:HA	1.85	0.41
2:J:350:HIS:HD1	2:J:364:ASP:CG	2.28	0.41
2:J:456:LEU:HD12	2:J:457:ASP:N	2.36	0.41
2:N:71:LEU:HD23	2:N:71:LEU:HA	1.93	0.41
2:N:132:LEU:HD23	2:N:310:VAL:HG21	2.03	0.41
2:O:211:TRP:CE3	2:O:250:ARG:HD3	2.56	0.41
1:P:13:GLU:HB3	1:P:14:THR:H	1.59	0.41
2:C:294:MET:O	2:C:294:MET:HG2	2.21	0.41
1:E:54:TYR:OH	2:J:183:GLY:HA3	2.21	0.41
2:G:146:GLN:HE22	2:G:282:ARG:NH1	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:442:LEU:HD12	2:G:456:LEU:HD12	2.03	0.41
2:H:83:HIS:C	2:H:84:ILE:HD12	2.46	0.41
2:H:211:TRP:CE3	2:H:250:ARG:HD3	2.56	0.41
2:K:350:HIS:HD1	2:K:364:ASP:CG	2.28	0.41
2:K:429:ASN:ND2	1:P:29:GLN:CD	2.79	0.41
1:L:28:ALA:HA	1:L:31:GLU:OE1	2.21	0.41
2:O:346:MET:HE3	2:O:346:MET:HB3	2.00	0.41
2:D:155:GLU:HG3	2:D:287:LEU:CD2	2.50	0.40
2:G:83:HIS:C	2:G:84:ILE:HD12	2.46	0.40
2:G:106:GLU:HG2	2:G:109:SER:OG	2.21	0.40
2:G:345:LEU:HA	2:G:345:LEU:HD23	1.90	0.40
2:G:406:HIS:CD2	2:G:408:TRP:H	2.38	0.40
1:I:13:GLU:HB3	1:I:14:THR:H	1.53	0.40
2:K:170:THR:HG22	2:K:198:LYS:HD3	2.02	0.40
2:K:273:ALA:O	2:K:276:THR:HG22	2.21	0.40
2:N:54:ILE:HG12	2:N:127:ILE:HD11	2.03	0.40
2:N:197:THR:OG1	2:N:235:HIS:ND1	2.51	0.40
2:N:407:PRO:HD3	2:N:458:LEU:HD23	2.03	0.40
2:O:384:MET:HE1	2:O:399:PHE:CE1	2.56	0.40
2:C:178:SER:HB3	1:I:97:GLN:OE1	2.21	0.40
2:D:300:ARG:NE	2:D:333:GLU:OE1	2.55	0.40
1:E:50:PRO:HD2	1:E:51:GLU:OE1	2.21	0.40
2:K:248:MET:HE1	2:K:280:TRP:CD1	2.56	0.40
1:L:58:TRP:CD1	1:L:59:LYS:HZ3	2.39	0.40
2:O:32:ASP:OD1	2:O:32:ASP:N	2.55	0.40
2:O:387:LEU:HA	2:O:387:LEU:HD23	1.88	0.40
2:G:316:ARG:HD3	2:G:365:TRP:CZ2	2.57	0.40
2:H:114:LEU:HD23	2:H:114:LEU:HA	1.79	0.40
2:N:380:HIS:CE1	2:N:382:TRP:HB2	2.56	0.40
2:N:441:ILE:HG13	2:N:441:ILE:H	1.77	0.40
1:A:44:PHE:HD2	1:A:85:CYS:HB3	1.85	0.40
2:C:167:LEU:HD23	2:C:167:LEU:HA	1.91	0.40
2:G:238:ASN:HA	2:G:263:MET:HG2	2.03	0.40
2:G:273:ALA:O	2:G:276:THR:HG22	2.21	0.40
1:I:30:ILE:HD13	1:I:71:VAL:HB	2.03	0.40
2:J:425:VAL:O	2:J:429:ASN:HB2	2.21	0.40
2:K:75:ASP:HA	2:K:78:LYS:HE3	2.04	0.40
2:N:248:MET:HE1	2:N:280:TRP:CD1	2.57	0.40
2:N:273:ALA:O	2:N:276:THR:HG22	2.22	0.40
2:N:281:CYS:SG	2:N:286:VAL:HG23	2.62	0.40
1:P:58:TRP:CD1	1:P:59:LYS:HG3	2.53	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:18:LYS:HE2	2:D:49:GLU:HB2	2.03	0.40
2:D:239:VAL:HG21	2:D:262:ILE:HD12	2.03	0.40
2:D:365:TRP:HA	2:D:365:TRP:HE3	1.87	0.40
2:G:419:VAL:HG12	2:G:452:LEU:HD22	2.04	0.40
2:J:259:MET:HE3	2:J:259:MET:HB3	1.98	0.40
2:O:175:LEU:HD11	2:O:202:ASN:ND2	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	98/111 (88%)	90 (92%)	8 (8%)	0	100	100
1	B	98/111 (88%)	89 (91%)	9 (9%)	0	100	100
1	E	98/111 (88%)	90 (92%)	8 (8%)	0	100	100
1	F	98/111 (88%)	92 (94%)	6 (6%)	0	100	100
1	I	98/111 (88%)	93 (95%)	5 (5%)	0	100	100
1	L	98/111 (88%)	91 (93%)	7 (7%)	0	100	100
1	M	98/111 (88%)	91 (93%)	7 (7%)	0	100	100
1	P	98/111 (88%)	94 (96%)	4 (4%)	0	100	100
2	C	458/472 (97%)	438 (96%)	20 (4%)	0	100	100
2	D	458/472 (97%)	442 (96%)	16 (4%)	0	100	100
2	G	460/472 (98%)	440 (96%)	20 (4%)	0	100	100
2	H	460/472 (98%)	442 (96%)	18 (4%)	0	100	100
2	J	460/472 (98%)	439 (95%)	21 (5%)	0	100	100
2	K	460/472 (98%)	444 (96%)	16 (4%)	0	100	100
2	N	460/472 (98%)	443 (96%)	17 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	O	460/472 (98%)	438 (95%)	22 (5%)	0	100	100
All	All	4460/4664 (96%)	4256 (95%)	204 (5%)	0	100	100

There are no Ramachandran outliers to report.

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 PDB entries followed by that with respect to all EM entries.

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	94/104 (90%)	94 (100%)	0	100	100
1	B	94/104 (90%)	94 (100%)	0	100	100
1	E	94/104 (90%)	93 (99%)	1 (1%)	70	79
1	F	94/104 (90%)	94 (100%)	0	100	100
1	I	94/104 (90%)	93 (99%)	1 (1%)	70	79
1	L	94/104 (90%)	94 (100%)	0	100	100
1	M	94/104 (90%)	93 (99%)	1 (1%)	70	79
1	P	94/104 (90%)	94 (100%)	0	100	100
2	C	374/383 (98%)	371 (99%)	3 (1%)	79	84
2	D	374/383 (98%)	372 (100%)	2 (0%)	86	90
2	G	376/383 (98%)	373 (99%)	3 (1%)	79	84
2	H	376/383 (98%)	374 (100%)	2 (0%)	86	90
2	J	376/383 (98%)	373 (99%)	3 (1%)	79	84
2	K	376/383 (98%)	373 (99%)	3 (1%)	79	84
2	N	376/383 (98%)	373 (99%)	3 (1%)	79	84
2	O	376/383 (98%)	374 (100%)	2 (0%)	86	90
All	All	3756/3896 (96%)	3732 (99%)	24 (1%)	82	88

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	C	32	ASP
2	C	70	LEU
2	C	346	MET
2	D	32	ASP
2	D	197	THR
1	E	18	LEU
2	G	124	PHE
2	G	222	ILE
2	G	459	TRP
2	H	325	SER
2	H	346	MET
1	I	107	ARG
2	J	70	LEU
2	J	229	THR
2	J	346	MET
2	K	210	ARG
2	K	346	MET
2	K	417	ASN
1	M	105	VAL
2	N	70	LEU
2	N	124	PHE
2	N	323	LEU
2	O	32	ASP
2	O	346	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (56) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	29	GLN
2	C	146	GLN
2	C	160	ASN
2	C	380	HIS
2	C	398	GLN
2	C	417	ASN
2	C	426	GLN
2	D	291	HIS
2	D	380	HIS
2	D	398	GLN
2	D	406	HIS
2	D	429	ASN
1	E	94	ASN
2	G	264	HIS
2	G	301	GLN

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Mol	Chain	Res	Type
2	G	304	HIS
2	G	380	HIS
2	G	398	GLN
2	G	406	HIS
2	G	417	ASN
2	G	426	GLN
2	H	291	HIS
2	H	301	GLN
2	H	304	HIS
2	H	380	HIS
2	H	398	GLN
2	H	417	ASN
2	H	426	GLN
2	H	429	ASN
2	J	146	GLN
2	J	380	HIS
2	J	417	ASN
2	K	146	GLN
2	K	202	ASN
2	K	291	HIS
2	K	380	HIS
2	K	398	GLN
2	K	406	HIS
2	K	417	ASN
2	K	429	ASN
1	L	29	GLN
1	L	97	GLN
1	M	29	GLN
1	M	97	GLN
2	N	146	GLN
2	N	291	HIS
2	N	380	HIS
2	N	398	GLN
2	N	429	ASN
2	O	83	HIS
2	O	264	HIS
2	O	380	HIS
2	O	398	GLN
2	O	417	ASN
2	O	429	ASN
1	P	36	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.