Full wwPDB X-ray Structure Validation Report (i)

Mar 9, 2024 – 08:41 PM EST

PDB ID	:	3UVA
Title	:	Crystal structure of L-rhamnose isomerase mutant W38F from Bacillus halodurans in complex with Mn
Authors	:	Doan, T.T.N.; Prabhu, P.; Jeya, M.; Kim, J.K.; Kang, L.W.; Lee, J.K.
Deposited on	:	2011-11-29
Resolution	:	2.69 Å(reported)

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

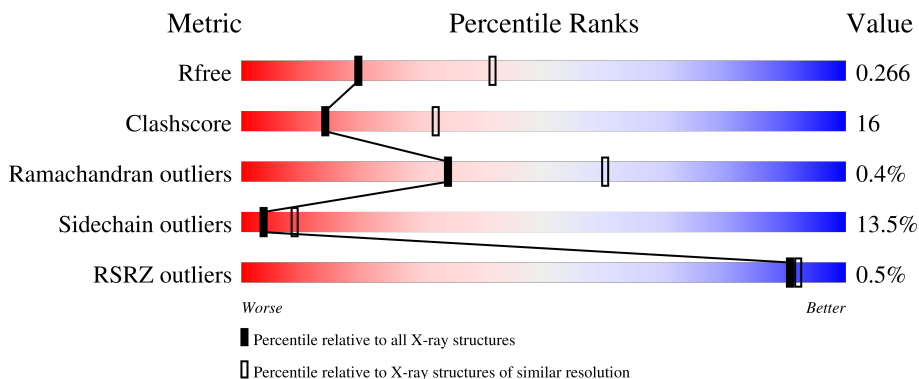|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.69 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	Percentile Ranks	Value
Rfree		0.266
Clashscore		16
Ramachandran outliers		0.4%
Sidechain outliers		13.5%
RSRZ outliers		0.5%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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 >=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 <=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	424	67% 22% 5% 5%
1	B	424	58% 30% 7% • 5%
1	C	424	% 67% 23% 6% •
1	D	424	61% 29% 5% 5%

W O R L D W I D E
wwPDB
PROTEIN DATA BANK

2   Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 13649 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 L-Rhamnose isomerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	402	Total 3289	C 2108	N 565	O 607	S 9	0	0	0
1	B	404	Total 3301	C 2115	N 567	O 609	S 10	0	0	0
1	C	405	Total 3307	C 2118	N 568	O 611	S 10	0	0	0
1	D	403	Total 3291	C 2110	N 564	O 608	S 9	0	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	HIS	-	expression tag	UNP Q9KCL9
A	-4	HIS	-	expression tag	UNP Q9KCL9
A	-3	HIS	-	expression tag	UNP Q9KCL9
A	-2	HIS	-	expression tag	UNP Q9KCL9
A	-1	HIS	-	expression tag	UNP Q9KCL9
A	0	HIS	-	expression tag	UNP Q9KCL9
A	38	PHE	TRP	engineered mutation	UNP Q9KCL9
B	-5	HIS	-	expression tag	UNP Q9KCL9
B	-4	HIS	-	expression tag	UNP Q9KCL9
B	-3	HIS	-	expression tag	UNP Q9KCL9
B	-2	HIS	-	expression tag	UNP Q9KCL9
B	-1	HIS	-	expression tag	UNP Q9KCL9
B	0	HIS	-	expression tag	UNP Q9KCL9
B	38	PHE	TRP	engineered mutation	UNP Q9KCL9
C	-5	HIS	-	expression tag	UNP Q9KCL9
C	-4	HIS	-	expression tag	UNP Q9KCL9
C	-3	HIS	-	expression tag	UNP Q9KCL9
C	-2	HIS	-	expression tag	UNP Q9KCL9
C	-1	HIS	-	expression tag	UNP Q9KCL9
C	0	HIS	-	expression tag	UNP Q9KCL9
C	38	PHE	TRP	engineered mutation	UNP Q9KCL9

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-5	HIS	-	expression tag	UNP Q9KCL9
D	-4	HIS	-	expression tag	UNP Q9KCL9
D	-3	HIS	-	expression tag	UNP Q9KCL9
D	-2	HIS	-	expression tag	UNP Q9KCL9
D	-1	HIS	-	expression tag	UNP Q9KCL9
D	0	HIS	-	expression tag	UNP Q9KCL9
D	38	PHE	TRP	engineered mutation	UNP Q9KCL9

- Molecule 2 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total 2	Mn 2	0	0
2	B	2	Total 2	Mn 2	0	0
2	C	2	Total 2	Mn 2	0	0
2	D	2	Total 2	Mn 2	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	133	Total 133	O 133	0	0
3	B	103	Total 103	O 103	0	0
3	C	131	Total 131	O 131	0	0
3	D	86	Total 86	O 86	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geome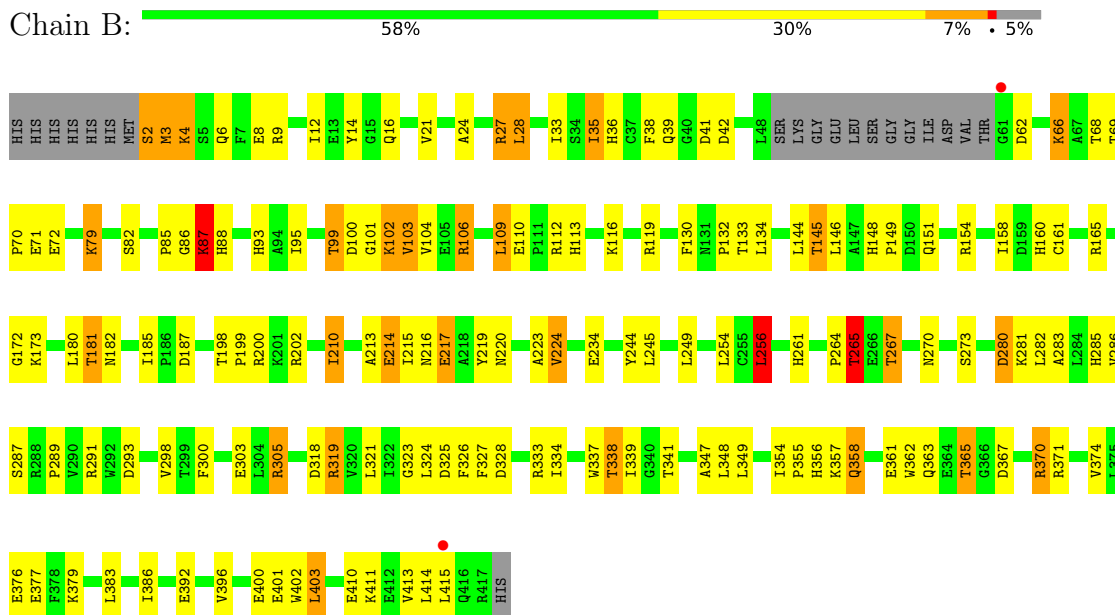try and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 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.
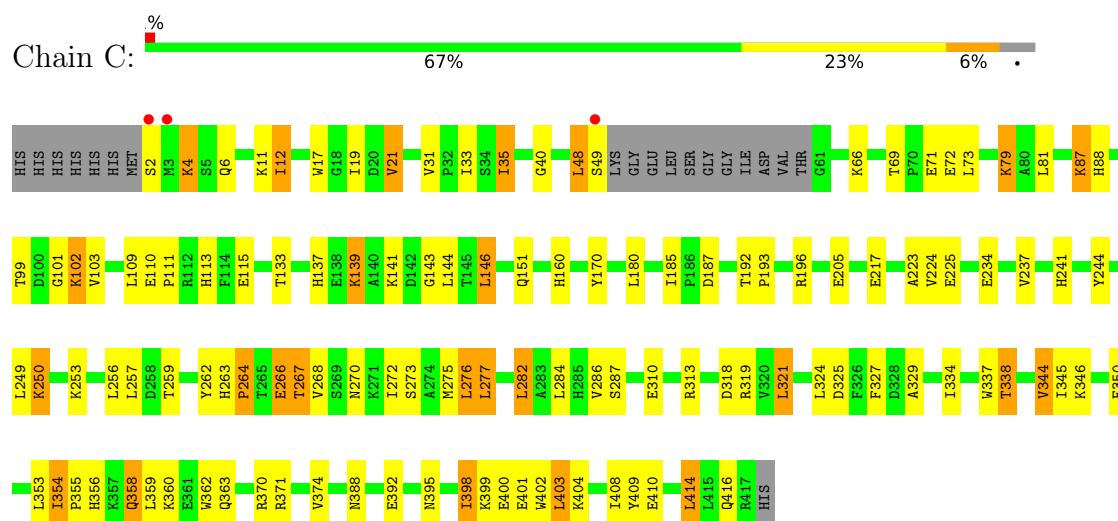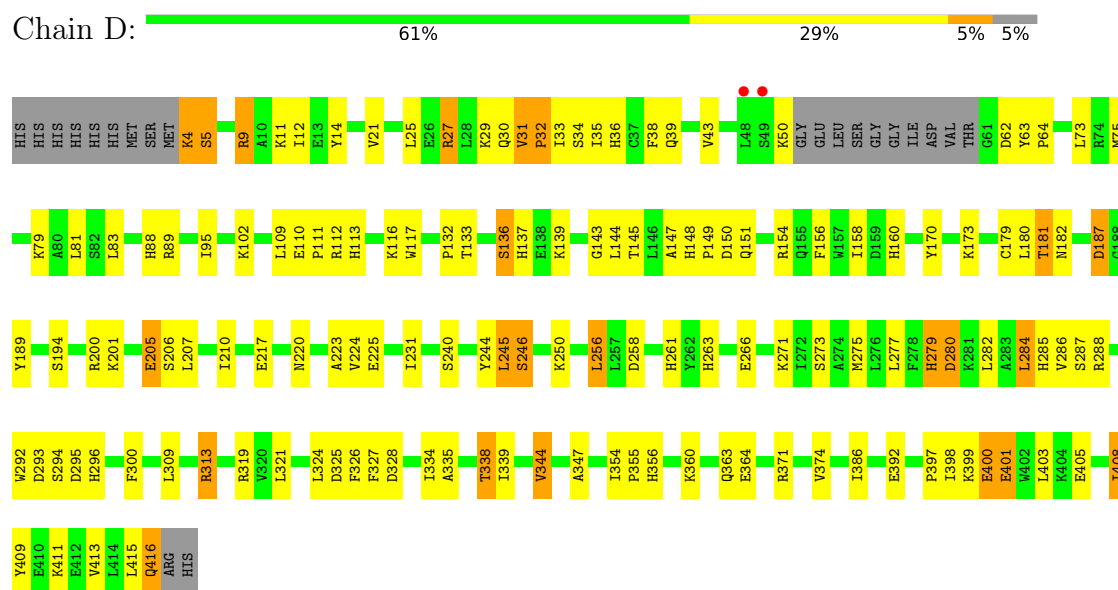
• Molecule 1: L-Rhamnose isomerase

• Molecule 1: L-Rhamnose isomerase

• Molecule 1: L-Rhamnose isomerase

Chain C:

67%　　23%　　6%　•

HIS HIS HIS HIS HIS HIS MET S2 M3 K4 S5 Q6 K11 I12 W17 G18 I19 D20 V21 V31 P32 I33 S34 I35 G40 L48 S49 LYS GLY GLU LEU SER GLY GLY ILE ASP VAL THR G61 K66 T69 P70 E71 E72 L73 K79 A80 L81 K87 H88

T99 D100 G101 K102 V103 L109 E110 P111 R112 H113 F114 E115 T133 H137 E138 K139 A140 K141 D142 G143 L144 T145 L146 Q151 H160 Y170 L180 I185 P186 D187 T192 P193 R196 E205 E217 A223 V224 E225 E234 V237 H241 Y244

L249 K250 K253 L256 L257 D258 T259 Y262 H263 P264 T265 E266 T267 V268 S269 N270 K271 I272 S273 A274 M275 L276 L277 L282 A283 L284 H285 V286 S287 E310 R313 D318 R319 V320 L321 L324 D325 F326 F327 D328 A329 I334 W337 T338 V344 I345 K346 F350

L353 I354 P355 H356 K357 Q358 L359 K360 E361 W362 Q363 R370 R371 V374 N388 E392 N395 I398 K399 E400 E401 W402 L403 K404 I408 Y409 E410 L414 L415 Q416 R417 HIS

• Molecule 1: L-Rhamnose isomerase

Chain D:

61%　　29%　　5% 5%

HIS HIS HIS HIS HIS MET SER MET K4 S5 R9 A10 K11 I12 E13 Y14 V21 L25 E26 R27 L28 K29 Q30 V31 P32 I33 S34 H36 C37 F38 Q39 V43 L48 S49 K50 GLY GLU LEU SER GLY ILE ASP VAL THR G61 D62 Y63 P64 L73 R74 M75

K79 A80 L81 S82 L83 H88 R89 I95 K102 L109 E110 P111 R112 H113 K116 W117 P132 T133 S136 H137 E138 K139 G143 L144 T145 L146 A147 H148 P149 D150 Q151 R154 Q155 F156 W157 I158 D159 H160 Y170 K173 C179 L180 T181 N182 D187 G188

Y189 S194 R200 K201 E205 S206 L207 I210 E217 N220 A223 V224 E225 I231 S240 Y244 L245 S246 K250 L256 L257 D258 H261 Y262 H263 E266 K271 I272 S273 A274 M275 L276 L277 F278 H279 D280 K281 L282 A283 L284 H285 V286 S287 R288

W292 D293 S294 D295 H296 F300 L309 R313 R319 V320 L321 L324 D325 F326 F327 D328 I334 A335 T338 I339 V344 A347 I354 P355 H356 K360 Q363 E364 R371 V374 I386 E392 P397 I398 K399 E400 E401 W402 L403 K404 E405 I408

Y409 E410 K411 E412 V413 L414 L415 Q416 ARG HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	83.37Å 164.78Å 92.82Å 90.00° 117.01° 90.00°	Depositor
Resolution (Å)	45.87 – 2.69 45.87 – 2.69	Depositor EDS
% Data completeness (in resolution range)	88.0 (45.87-2.69) 88.0 (45.87-2.69)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.88 (at 2.69Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.185 , 0.266 0.189 , 0.266	Depositor DCC
R_{free} test set	2778 reflections (5.12%)	wwPDB-VP
Wilson B-factor (Å^2)	36.6	Xtriage
Anisotropy	0.072	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 32.2	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.021 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	13649	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.34% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: MN

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	0.82	0/3369	0.85	5/4560 (0.1%)
1	B	0.76	1/3381 (0.0%)	0.84	3/4575 (0.1%)
1	C	0.80	5/3387 (0.1%)	0.84	0/4583
1	D	0.82	0/3371	0.82	1/4562 (0.0%)
All	All	0.80	6/13508 (0.0%)	0.84	9/18280 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	266	GLU	CD-OE2	-5.56	1.19	1.25
1	C	266	GLU	CD-OE1	-5.55	1.19	1.25
1	C	262	TYR	CE1-CZ	-5.44	1.31	1.38
1	C	205	GLU	CB-CG	5.31	1.62	1.52
1	C	392	GLU	CG-CD	5.22	1.59	1.51
1	B	8	GLU	CG-CD	5.07	1.59	1.51

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	87	LYS	N-CA-C	-5.69	95.65	111.00
1	D	415	LEU	CA-CB-CG	5.63	128.24	115.30
1	B	415	LEU	CA-CB-CG	5.34	127.59	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	301	ASP	CB-CG-OD1	5.33	123.10	118.30
1	A	367	ASP	CB-CG-OD1	5.26	123.04	118.30
1	A	282	LEU	CA-CB-CG	5.23	127.33	115.30
1	A	414	LEU	CA-CB-CG	5.21	127.28	115.30
1	A	367	ASP	CB-CG-OD2	-5.08	113.73	118.30
1	B	256	LEU	CA-CB-CG	5.03	126.86	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	47	GLU	Peptide

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	3289	0	3245	92	1
1	B	3301	0	3257	153	0
1	C	3307	0	3262	81	0
1	D	3291	0	3248	105	1
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	133	0	0	5	0
3	B	103	0	0	4	0
3	C	131	0	0	6	0
3	D	86	0	0	4	0
All	All	13649	0	13012	415	1

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 16.

All (415) 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:102:LYS:HA	1:B:103:VAL:CG2	1.14	1.53
1:B:102:LYS:CA	1:B:103:VAL:HG23	1.49	1.40
1:B:102:LYS:CA	1:B:103:VAL:CG2	2.06	1.32
1:D:27:ARG:O	1:D:30:GLN:HG2	1.30	1.27
1:A:48:LEU:HD13	1:A:48:LEU:C	1.54	1.22
1:A:48:LEU:CD1	1:A:49:SER:HB3	1.73	1.18
1:B:87:LYS:HE2	1:B:87:LYS:HA	1.32	1.12
1:A:286:VAL:HG23	1:A:298:VAL:HG21	1.24	1.11
1:D:4:LYS:N	1:D:4:LYS:HE2	1.66	1.11
1:D:4:LYS:HG2	1:D:5:SER:H	1.07	1.09
1:D:27:ARG:HG3	1:D:30:GLN:HE21	1.07	1.09
1:B:102:LYS:HD3	1:B:102:LYS:N	1.44	1.09
1:B:102:LYS:HA	1:B:103:VAL:HG22	1.23	1.08
1:B:4:LYS:HD3	1:B:4:LYS:H	1.13	1.08
1:C:87:LYS:O	1:C:87:LYS:HG2	1.48	1.07
1:D:27:ARG:O	1:D:30:GLN:CG	2.06	1.02
1:A:145:THR:HG22	1:A:146:LEU:H	1.22	1.02
1:B:249:LEU:HD11	1:D:246:SER:HB3	1.41	1.01
1:A:48:LEU:C	1:A:48:LEU:CD1	2.30	0.98
1:A:48:LEU:HD13	1:A:49:SER:HB3	1.33	0.98
1:B:245:LEU:HD22	1:D:245:LEU:HD22	1.46	0.97
1:B:102:LYS:CB	1:B:103:VAL:HG23	1.95	0.96
1:B:264:PRO:O	1:B:265:THR:HB	1.66	0.95
1:D:181:THR:HG22	1:D:220:ASN:OD1	1.66	0.95
1:D:4:LYS:N	1:D:4:LYS:CE	2.30	0.95
1:D:409:TYR:O	1:D:413:VAL:HG12	1.66	0.95
1:A:48:LEU:CD1	1:A:49:SER:CB	2.46	0.94
1:B:86:GLY:HA3	1:B:87:LYS:CE	1.98	0.94
1:B:161:CYS:HB3	1:B:210:ILE:HD13	1.49	0.94
1:B:145:THR:HG22	1:B:146:LEU:N	1.83	0.93
1:B:3:MET:O	1:B:6:GLN:HB2	1.69	0.92
1:B:4:LYS:H	1:B:4:LYS:CD	1.81	0.92
1:C:358:GLN:HE21	1:C:358:GLN:N	1.66	0.91
1:A:48:LEU:HD11	1:A:49:SER:HB3	1.52	0.90
1:D:280:ASP:O	1:D:319:ARG:HD2	1.71	0.90
1:A:48:LEU:HD13	1:A:49:SER:N	1.85	0.89
1:B:102:LYS:HD3	1:B:102:LYS:H	1.32	0.89
1:B:102:LYS:N	1:B:102:LYS:CD	2.29	0.89
1:D:27:ARG:HG3	1:D:30:GLN:NE2	1.86	0.89
1:C:358:GLN:HE21	1:C:358:GLN:H	0.92	0.89
1:D:110:GLU:H	1:D:113:HIS:HD2	1.18	0.88
1:D:4:LYS:HG2	1:D:5:SER:N	1.86	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:48:LEU:HD13	1:A:49:SER:CB	2.01	0.88
1:B:261:HIS:CD2	1:B:293:ASP:OD2	2.28	0.87
1:D:4:LYS:CG	1:D:5:SER:H	1.88	0.87
1:A:145:THR:HG22	1:A:146:LEU:N	1.91	0.86
1:C:287:SER:HB3	1:C:325:ASP:O	1.75	0.86
1:B:86:GLY:HA3	1:B:87:LYS:HE3	1.55	0.86
1:D:4:LYS:N	1:D:4:LYS:HZ3	1.72	0.85
1:C:137:HIS:HD2	1:C:139:LYS:H	1.24	0.85
1:B:4:LYS:HD3	1:B:4:LYS:N	1.93	0.83
1:A:286:VAL:CG2	1:A:298:VAL:HG21	2.09	0.83
1:C:264:PRO:HD3	3:C:505:HOH:O	1.79	0.83
1:B:87:LYS:HE2	1:B:87:LYS:CA	2.09	0.82
1:B:249:LEU:HD11	1:D:246:SER:CB	2.09	0.82
1:A:104:VAL:CG2	1:A:109:LEU:HD12	2.10	0.82
1:B:4:LYS:CD	1:B:4:LYS:N	2.41	0.82
1:C:363:GLN:HE21	1:C:371:ARG:HH11	1.29	0.81
1:C:110:GLU:H	1:C:113:HIS:HD2	1.27	0.81
1:B:267:THR:HG21	3:B:497:HOH:O	1.79	0.81
1:C:35:ILE:HD12	1:C:337:TRP:CD1	2.16	0.81
1:C:358:GLN:H	1:C:358:GLN:NE2	1.75	0.81
1:B:145:THR:HG22	1:B:146:LEU:H	1.42	0.80
1:B:305:ARG:HH11	1:B:305:ARG:HG3	1.45	0.80
1:B:102:LYS:CA	1:B:103:VAL:HG22	1.94	0.80
1:A:180:LEU:HD22	1:A:321:LEU:HD23	1.65	0.79
1:C:334:ILE:O	1:C:338:THR:HG23	1.83	0.79
1:C:410:GLU:HA	1:C:414:LEU:HB2	1.63	0.79
1:D:4:LYS:N	1:D:4:LYS:NZ	2.30	0.79
1:A:195:ASP:OD2	1:A:198:THR:CG2	2.30	0.79
1:A:195:ASP:OD2	1:A:198:THR:HG23	1.85	0.77
1:A:286:VAL:HG23	1:A:298:VAL:CG2	2.09	0.76
1:B:324:LEU:HD13	1:B:326:PHE:CE2	2.20	0.76
1:C:137:HIS:HE1	3:C:537:HOH:O	1.67	0.76
1:B:3:MET:HE1	1:B:392:GLU:HG3	1.68	0.76
1:B:86:GLY:HA3	1:B:87:LYS:HE2	1.67	0.76
1:A:145:THR:CG2	1:A:146:LEU:N	2.49	0.75
1:A:310:GLU:OE2	1:C:196:ARG:HD2	1.86	0.75
1:B:245:LEU:CD2	1:D:245:LEU:HD22	2.16	0.75
1:D:408:ILE:HG12	1:D:409:TYR:N	2.00	0.75
1:B:148:HIS:ND1	1:B:149:PRO:HD2	2.02	0.75
1:D:416:GLN:HE21	1:D:416:GLN:C	1.91	0.74
1:D:110:GLU:H	1:D:113:HIS:CD2	2.03	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:48:LEU:HD13	1:A:48:LEU:O	1.88	0.74
1:A:287:SER:HB3	1:A:325:ASP:O	1.87	0.73
1:B:130:PHE:O	1:B:181:THR:HA	1.88	0.73
1:A:284:LEU:HD12	1:A:284:LEU:O	1.88	0.73
1:C:17:TRP:HB2	1:C:19:ILE:HG12	1.70	0.72
1:B:110:GLU:H	1:B:113:HIS:HD2	1.36	0.71
1:B:102:LYS:HA	1:B:103:VAL:HG23	0.71	0.71
1:B:6:GLN:HA	1:B:6:GLN:HE21	1.54	0.71
1:B:334:ILE:O	1:B:338:THR:HG23	1.90	0.71
1:B:287:SER:HB3	1:B:325:ASP:O	1.89	0.71
1:D:30:GLN:HG3	1:D:31:VAL:HG12	1.72	0.70
1:D:398:ILE:HD12	1:D:399:LYS:HG3	1.74	0.70
1:A:168:GLY:O	1:A:171:PHE:HB2	1.91	0.70
1:A:77:LEU:O	1:A:81:LEU:HD22	1.91	0.69
1:A:104:VAL:CG2	1:A:109:LEU:CD1	2.70	0.69
1:B:249:LEU:CD1	1:D:246:SER:HB3	2.19	0.69
1:B:267:THR:CG2	1:B:270:ASN:H	2.06	0.69
1:C:69:THR:CG2	1:C:71:GLU:HG2	2.23	0.69
1:B:66:LYS:HB3	1:B:333:ARG:CZ	2.23	0.69
1:B:145:THR:CG2	1:B:146:LEU:N	2.55	0.69
1:C:273:SER:HA	1:C:276:LEU:HD12	1.75	0.69
1:D:416:GLN:HG2	3:D:451:HOH:O	1.93	0.69
1:B:36:HIS:HB2	1:B:38:PHE:CE2	2.28	0.68
1:B:261:HIS:HD2	1:B:293:ASP:OD2	1.75	0.68
1:B:86:GLY:CA	1:B:87:LYS:HE2	2.23	0.68
1:B:133:THR:H	1:B:160:HIS:HE1	1.42	0.68
1:C:398:ILE:HG13	1:C:399:LYS:HG3	1.76	0.68
1:C:87:LYS:O	1:C:87:LYS:CG	2.33	0.67
1:A:110:GLU:H	1:A:113:HIS:HD2	1.42	0.67
1:B:39:GLN:HE22	1:B:328:ASP:H	1.40	0.67
1:D:148:HIS:ND1	1:D:149:PRO:HD2	2.09	0.67
1:D:334:ILE:O	1:D:338:THR:HG23	1.93	0.67
1:D:62:ASP:O	1:D:63:TYR:C	2.32	0.67
1:D:287:SER:HB3	1:D:325:ASP:O	1.95	0.66
1:B:2:SER:O	1:B:6:GLN:HG2	1.95	0.66
1:C:4:LYS:H	1:C:4:LYS:HD3	1.61	0.66
1:D:110:GLU:N	1:D:113:HIS:HD2	1.91	0.66
1:B:363:GLN:HE22	1:D:194:SER:H	1.42	0.65
1:B:286:VAL:HG23	1:B:298:VAL:HG21	1.78	0.65
1:D:271:LYS:O	1:D:275:MET:HG2	1.97	0.64
1:C:110:GLU:N	1:C:113:HIS:HD2	1.95	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:104:VAL:HG21	1:A:109:LEU:HD12	1.78	0.64
1:D:132:PRO:HD2	1:D:182:ASN:O	1.98	0.64
1:B:102:LYS:HB3	1:B:103:VAL:HG23	1.77	0.64
1:D:256:LEU:HD11	1:D:285:HIS:CG	2.33	0.63
1:B:102:LYS:H	1:B:102:LYS:CD	1.97	0.63
1:B:85:PRO:HD3	1:B:396:VAL:HG21	1.79	0.63
1:B:410:GLU:HA	1:B:414:LEU:HB2	1.79	0.63
1:A:48:LEU:CD1	1:A:49:SER:N	2.59	0.63
1:A:359:LEU:HD21	1:A:374:VAL:HG22	1.79	0.63
1:B:145:THR:HB	1:B:187:ASP:OD1	1.99	0.63
1:B:267:THR:HG23	1:B:270:ASN:H	1.63	0.63
1:D:300:PHE:HE1	1:D:347:ALA:HA	1.63	0.62
1:C:263:HIS:HB2	1:C:266:GLU:OE1	1.99	0.62
1:B:286:VAL:CG2	1:B:298:VAL:HG21	2.29	0.62
1:A:299:THR:HA	1:A:343:ASN:HD22	1.64	0.62
1:B:355:PRO:HB2	1:B:358:GLN:HG3	1.81	0.62
1:B:305:ARG:HG3	1:B:305:ARG:NH1	2.14	0.62
1:D:136:SER:O	1:D:137:HIS:HB2	2.00	0.62
1:A:389:GLU:O	1:A:392:GLU:HB2	2.01	0.61
1:A:48:LEU:HD13	1:A:49:SER:CA	2.30	0.61
1:B:85:PRO:O	1:B:88:HIS:NE2	2.31	0.61
1:A:288:ARG:HB3	1:A:296:HIS:HB2	1.83	0.60
1:B:148:HIS:CG	1:B:149:PRO:HD2	2.36	0.60
1:D:139:LYS:HD3	1:D:156:PHE:CD1	2.36	0.60
1:D:14:TYR:CE2	1:D:386:ILE:CD1	2.84	0.60
1:D:279:HIS:HB3	3:D:434:HOH:O	2.01	0.60
1:B:181:THR:CG2	1:B:220:ASN:OD1	2.49	0.60
1:B:324:LEU:HD13	1:B:326:PHE:HE2	1.65	0.60
1:C:327:PHE:CE1	1:C:329:ALA:HB2	2.37	0.60
1:B:33:ILE:O	1:B:88:HIS:HB3	2.01	0.60
1:A:334:ILE:O	1:A:338:THR:HG22	2.02	0.60
1:C:400:GLU:O	1:C:403:LEU:HB2	2.02	0.60
1:A:148:HIS:O	1:A:154:ARG:HD3	2.02	0.59
1:D:133:THR:H	1:D:160:HIS:HE1	1.50	0.59
1:A:413:VAL:HG23	1:A:414:LEU:N	2.18	0.59
1:A:334:ILE:O	1:A:338:THR:CG2	2.51	0.58
1:A:161:CYS:HB2	1:A:210:ILE:HG12	1.84	0.58
1:A:194:SER:H	1:C:363:GLN:NE2	2.02	0.57
1:B:214:GLU:N	1:B:214:GLU:OE2	2.38	0.57
1:B:161:CYS:HB3	1:B:210:ILE:CD1	2.28	0.57
1:B:367:ASP:OD2	1:B:370:ARG:CD	2.53	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:280:ASP:O	1:B:319:ARG:CG	2.52	0.57
1:D:14:TYR:CE2	1:D:386:ILE:HD11	2.39	0.57
1:A:151:GLN:HG3	1:A:154:ARG:NH2	2.20	0.56
1:B:256:LEU:HD22	1:B:283:ALA:HB1	1.86	0.56
1:A:145:THR:HB	1:A:187:ASP:OD1	2.05	0.56
1:D:335:ALA:O	1:D:339:ILE:HG13	2.06	0.56
1:B:2:SER:O	1:B:6:GLN:CG	2.53	0.56
1:A:110:GLU:H	1:A:113:HIS:CD2	2.22	0.56
1:A:154:ARG:O	1:A:158:ILE:HG13	2.06	0.56
1:C:40:GLY:HA3	1:C:73:LEU:CD1	2.36	0.56
1:B:99:THR:HB	1:B:102:LYS:O	2.07	0.55
1:D:354:ILE:HG23	1:D:355:PRO:HD2	1.88	0.55
1:A:13:GLU:HA	1:A:16:GLN:NE2	2.21	0.55
1:D:181:THR:CG2	1:D:220:ASN:OD1	2.46	0.55
1:C:363:GLN:NE2	1:C:371:ARG:HH11	2.00	0.54
1:A:295:ASP:HB3	1:A:327:PHE:H	1.71	0.54
1:B:256:LEU:HD22	1:B:283:ALA:CB	2.37	0.54
1:D:39:GLN:HE22	1:D:328:ASP:H	1.55	0.54
1:B:265:THR:HG22	1:D:263:HIS:HD2	1.73	0.54
1:B:24:ALA:O	1:B:28:LEU:HB2	2.08	0.54
1:A:250:LYS:HE3	1:C:249:LEU:HG	1.90	0.54
1:A:284:LEU:HD12	1:A:284:LEU:C	2.28	0.53
1:B:134:LEU:HD22	1:B:185:ILE:HG22	1.89	0.53
1:B:367:ASP:OD2	1:B:370:ARG:HD2	2.08	0.53
1:A:198:THR:N	1:A:199:PRO:HD2	2.23	0.53
1:B:273:SER:OG	1:D:200:ARG:NH1	2.35	0.53
1:C:275:MET:HG2	1:C:282:LEU:HD21	1.89	0.53
1:B:106:ARG:O	1:B:160:HIS:HD2	1.91	0.53
1:D:73:LEU:HD23	1:D:117:TRP:HH2	1.72	0.53
1:C:111:PRO:HB3	1:C:170:TYR:CD2	2.44	0.53
1:D:62:ASP:C	1:D:62:ASP:OD1	2.46	0.53
1:B:3:MET:HB2	1:B:4:LYS:HD2	1.91	0.52
1:A:194:SER:H	1:C:363:GLN:HE22	1.57	0.52
1:B:42:ASP:HA	1:B:327:PHE:CE1	2.44	0.52
1:A:299:THR:HA	1:A:343:ASN:ND2	2.24	0.52
1:B:68:THR:HB	1:B:72:GLU:OE1	2.10	0.52
1:B:349:LEU:HD21	1:B:386:ILE:HG22	1.91	0.52
1:C:110:GLU:H	1:C:113:HIS:CD2	2.17	0.52
1:B:106:ARG:HA	1:B:109:LEU:HD22	1.90	0.52
1:B:400:GLU:O	1:B:403:LEU:HB2	2.10	0.51
1:C:362:TRP:CZ2	1:C:370:ARG:HD3	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:250:LYS:HE3	1:C:250:LYS:HA	1.92	0.51
1:D:180:LEU:HD11	1:D:223:ALA:HB2	1.93	0.51
1:A:413:VAL:CG2	1:A:414:LEU:N	2.74	0.51
1:B:280:ASP:O	1:B:319:ARG:HG3	2.11	0.51
1:B:362:TRP:CE2	1:B:370:ARG:HG3	2.46	0.51
1:B:99:THR:HG21	1:B:104:VAL:HG23	1.92	0.51
1:A:70:PRO:HB2	1:A:74:ARG:NH2	2.27	0.50
1:D:143:GLY:O	1:D:144:LEU:HD12	2.11	0.50
1:D:309:LEU:O	1:D:313:ARG:HB3	2.11	0.50
1:D:4:LYS:CG	1:D:5:SER:N	2.60	0.50
1:B:132:PRO:HD2	1:B:182:ASN:O	2.11	0.50
1:B:300:PHE:C	1:B:305:ARG:HH12	2.15	0.50
1:A:100:ASP:OD1	1:A:100:ASP:O	2.30	0.50
1:A:115:GLU:HB2	3:A:527:HOH:O	2.11	0.50
1:C:143:GLY:O	1:C:187:ASP:HA	2.12	0.50
1:B:39:GLN:HE21	1:B:326:PHE:HD1	1.58	0.50
1:C:408:ILE:HG13	1:C:409:TYR:N	2.26	0.50
1:B:6:GLN:HA	1:B:6:GLN:NE2	2.23	0.49
1:B:286:VAL:HG23	1:B:298:VAL:CG2	2.42	0.49
1:D:11:LYS:HG3	1:D:21:VAL:CG2	2.42	0.49
1:C:11:LYS:HG3	1:C:21:VAL:HG13	1.94	0.49
1:B:354:ILE:O	1:B:356:HIS:N	2.44	0.49
1:D:36:HIS:HB2	1:D:38:PHE:CE2	2.47	0.49
1:D:201:LYS:O	1:D:205:GLU:HG2	2.12	0.49
1:B:71:GLU:HG2	3:B:456:HOH:O	2.11	0.49
1:B:214:GLU:HA	3:B:442:HOH:O	2.12	0.49
1:C:33:ILE:O	1:C:88:HIS:HB3	2.12	0.49
1:C:267:THR:HG22	1:C:267:THR:O	2.12	0.49
1:A:99:THR:O	1:A:99:THR:OG1	2.29	0.49
1:A:124:HIS:HE1	3:A:528:HOH:O	1.96	0.49
1:B:102:LYS:HB3	1:B:103:VAL:C	2.33	0.49
1:C:356:HIS:O	1:C:360:LYS:HG3	2.13	0.49
1:B:376:GLU:HA	1:B:379:LYS:HD2	1.95	0.48
1:B:287:SER:O	1:B:289:PRO:HD3	2.13	0.48
1:B:101:GLY:C	1:B:102:LYS:HD3	2.24	0.48
1:A:104:VAL:HG23	1:A:109:LEU:CD1	2.43	0.48
1:C:324:LEU:HD21	1:C:344:VAL:HG11	1.96	0.48
1:C:99:THR:O	1:C:102:LYS:HG3	2.13	0.48
1:B:367:ASP:OD2	1:B:370:ARG:HD3	2.13	0.48
1:C:257:LEU:HD21	1:C:275:MET:CE	2.44	0.48
1:D:397:PRO:HB3	1:D:401:GLU:HB3	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:300:PHE:HE1	1:A:347:ALA:HA	1.79	0.48
1:B:134:LEU:HD23	1:B:145:THR:HG21	1.96	0.48
1:B:363:GLN:HE21	1:B:371:ARG:HH11	1.62	0.48
1:C:257:LEU:HD11	1:C:275:MET:HE2	1.96	0.48
1:B:224:VAL:HB	1:B:244:TYR:CD1	2.49	0.48
1:A:374:VAL:O	1:A:375:LEU:C	2.52	0.47
1:C:48:LEU:HD21	1:C:101:GLY:O	2.14	0.47
1:B:181:THR:HG23	1:B:220:ASN:OD1	2.13	0.47
1:B:68:THR:N	1:B:72:GLU:OE1	2.48	0.47
1:C:180:LEU:HD22	1:C:321:LEU:HD23	1.95	0.47
1:D:224:VAL:HB	1:D:244:TYR:CD1	2.49	0.47
1:D:144:LEU:HD23	1:D:147:ALA:O	2.14	0.47
1:A:196:ARG:O	1:A:200:ARG:HD2	2.14	0.47
1:C:225:GLU:HG3	1:C:256:LEU:HD22	1.96	0.47
1:B:14:TYR:HE2	1:B:386:ILE:HD13	1.80	0.47
1:D:27:ARG:C	1:D:30:GLN:HG2	2.24	0.47
1:D:356:HIS:O	1:D:360:LYS:HG3	2.15	0.47
1:C:69:THR:HG21	1:C:71:GLU:HG2	1.95	0.47
1:C:257:LEU:HD11	1:C:275:MET:CE	2.45	0.47
1:C:217:GLU:HG3	3:C:456:HOH:O	2.14	0.46
1:C:69:THR:HB	1:C:72:GLU:HB2	1.96	0.46
1:D:95:ILE:CG2	1:D:133:THR:HG21	2.45	0.46
1:A:279:HIS:HB3	3:A:508:HOH:O	2.14	0.46
1:C:267:THR:CG2	1:C:270:ASN:H	2.28	0.46
1:D:95:ILE:HG23	1:D:133:THR:HG21	1.95	0.46
1:D:292:TRP:O	1:D:294:SER:N	2.49	0.46
1:A:99:THR:OG1	1:A:102:LYS:O	2.28	0.46
1:A:251:ASN:O	1:A:253:LYS:HG2	2.15	0.46
1:C:395:ASN:HA	3:C:447:HOH:O	2.16	0.46
1:A:5:SER:O	1:A:9:ARG:HG2	2.15	0.46
1:B:200:ARG:NH1	1:D:273:SER:OG	2.47	0.46
1:C:224:VAL:HB	1:C:244:TYR:CD1	2.51	0.46
1:D:11:LYS:HG3	1:D:21:VAL:HG22	1.98	0.46
1:D:34:SER:HA	1:D:89:ARG:HB2	1.97	0.46
1:A:158:ILE:HG23	1:A:210:ILE:HG13	1.96	0.46
1:B:413:VAL:HG23	1:B:414:LEU:N	2.31	0.45
1:B:36:HIS:ND1	1:B:36:HIS:N	2.62	0.45
1:B:377:GLU:OE1	1:B:377:GLU:HA	2.15	0.45
1:B:165:ARG:NH1	1:B:213:ALA:O	2.46	0.45
1:D:5:SER:O	1:D:9:ARG:HB2	2.15	0.45
1:D:398:ILE:O	1:D:401:GLU:HB2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:197:LEU:HD11	1:C:277:LEU:HD13	1.99	0.45
1:B:86:GLY:CA	1:B:87:LYS:CE	2.79	0.45
1:C:310:GLU:OE2	1:C:313:ARG:NH1	2.50	0.45
1:C:318:ASP:HB2	3:C:467:HOH:O	2.16	0.45
1:C:402:TRP:CZ3	1:C:403:LEU:HD13	2.51	0.45
1:C:79:LYS:HD3	1:C:79:LYS:HA	1.73	0.45
1:A:250:LYS:HD3	1:A:250:LYS:HA	1.75	0.45
1:B:69:THR:HB	1:B:70:PRO:CD	2.47	0.45
1:D:405:GLU:HA	1:D:408:ILE:HD13	1.99	0.45
1:A:74:ARG:NH2	1:A:98:GLU:OE1	2.43	0.45
1:A:309:LEU:HD23	1:A:309:LEU:HA	1.68	0.45
1:B:285:HIS:HA	1:B:323:GLY:O	2.17	0.45
1:B:410:GLU:HG3	1:B:410:GLU:O	2.16	0.45
1:D:217:GLU:HG2	3:D:502:HOH:O	2.16	0.45
1:B:291:ARG:NH1	1:B:291:ARG:HG2	2.31	0.44
1:D:21:VAL:O	1:D:25:LEU:HG	2.17	0.44
1:B:305:ARG:HH11	1:B:305:ARG:CG	2.22	0.44
1:C:137:HIS:CD2	1:C:139:LYS:HB2	2.52	0.44
1:B:148:HIS:ND1	1:B:149:PRO:CD	2.78	0.44
1:C:12:ILE:H	1:C:12:ILE:HG12	1.61	0.44
1:D:33:ILE:O	1:D:88:HIS:HB3	2.17	0.44
1:B:134:LEU:HD23	1:B:145:THR:CG2	2.48	0.44
1:D:4:LYS:HE2	1:D:4:LYS:CA	2.39	0.44
1:A:48:LEU:HD11	1:A:49:SER:CB	2.29	0.44
1:B:102:LYS:HB3	1:B:103:VAL:O	2.17	0.44
1:B:180:LEU:HD11	1:B:223:ALA:HB2	2.00	0.44
1:B:303:GLU:HA	1:B:303:GLU:OE1	2.18	0.44
1:D:136:SER:O	1:D:137:HIS:CB	2.65	0.44
1:B:69:THR:HB	1:B:70:PRO:HD2	1.98	0.44
1:D:284:LEU:O	1:D:285:HIS:HD2	2.00	0.44
1:A:104:VAL:HG23	1:A:109:LEU:HD12	1.96	0.44
1:B:106:ARG:O	1:B:160:HIS:CD2	2.71	0.44
1:D:225:GLU:HG3	1:D:256:LEU:HD12	1.98	0.44
1:B:79:LYS:HA	1:B:79:LYS:HD3	1.73	0.44
1:B:254:LEU:HD22	1:B:281:LYS:O	2.17	0.44
1:B:267:THR:HG22	1:B:270:ASN:HB3	2.00	0.44
1:D:148:HIS:CE1	1:D:149:PRO:HD2	2.52	0.44
1:D:189:TYR:HA	3:D:475:HOH:O	2.18	0.44
1:A:327:PHE:CE2	1:A:329:ALA:HB2	2.53	0.44
1:A:410:GLU:HG3	1:A:414:LEU:HD12	1.99	0.44
1:B:172:GLY:HA3	1:B:219:TYR:O	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:62:ASP:O	1:D:63:TYR:O	2.35	0.44
1:D:83:LEU:HD12	1:D:338:THR:HG21	2.00	0.44
1:B:318:ASP:HB2	3:B:443:HOH:O	2.18	0.43
1:D:200:ARG:HH21	1:D:240:SER:HB3	1.82	0.43
1:D:300:PHE:HE1	1:D:347:ALA:CA	2.31	0.43
1:B:361:GLU:O	1:B:365:THR:HB	2.18	0.43
1:C:2:SER:O	1:C:6:GLN:HG2	2.17	0.43
1:D:207:LEU:HA	1:D:210:ILE:HD12	1.99	0.43
1:A:187:ASP:HB3	1:A:238:VAL:HG21	1.99	0.43
1:A:242:GLU:OE2	1:C:241:HIS:HE1	2.00	0.43
1:A:5:SER:O	1:A:6:GLN:C	2.49	0.43
1:D:150:ASP:C	1:D:150:ASP:OD1	2.57	0.43
1:C:370:ARG:O	1:C:374:VAL:HG13	2.18	0.43
1:A:361:GLU:O	1:A:365:THR:HB	2.19	0.43
1:B:102:LYS:CB	1:B:103:VAL:C	2.87	0.43
1:B:363:GLN:NE2	1:D:194:SER:H	2.11	0.43
1:B:87:LYS:HA	1:B:87:LYS:CE	2.22	0.43
1:B:134:LEU:CD2	1:B:145:THR:HG21	2.48	0.43
1:B:154:ARG:NH1	1:B:202:ARG:HD3	2.33	0.43
1:B:413:VAL:CG2	1:B:414:LEU:N	2.82	0.43
1:D:324:LEU:HD13	1:D:326:PHE:CE2	2.54	0.43
1:A:394:MET:O	1:A:395:ASN:CB	2.66	0.42
1:B:148:HIS:CE1	1:B:149:PRO:HD2	2.53	0.42
1:D:30:GLN:HG3	1:D:31:VAL:N	2.32	0.42
1:D:158:ILE:HD11	1:D:206:SER:HA	2.00	0.42
1:B:130:PHE:HB3	1:B:181:THR:HB	2.00	0.42
1:A:184:TRP:CZ2	1:A:227:LYS:HE2	2.54	0.42
1:C:273:SER:HA	1:C:276:LEU:CD1	2.46	0.42
1:C:192:THR:HA	1:C:193:PRO:HD2	1.76	0.42
1:D:145:THR:H	1:D:187:ASP:CG	2.21	0.42
1:A:303:GLU:OE1	1:A:303:GLU:HA	2.19	0.42
1:C:277:LEU:HD12	1:C:277:LEU:HA	1.62	0.42
1:D:258:ASP:HB3	1:D:261:HIS:CG	2.55	0.42
1:A:184:TRP:HZ2	1:A:227:LYS:HE2	1.84	0.42
1:B:102:LYS:C	1:B:103:VAL:HG22	2.31	0.42
1:C:180:LEU:HD11	1:C:223:ALA:HB2	2.01	0.42
1:C:354:ILE:HG23	1:C:355:PRO:HD2	2.02	0.42
1:D:148:HIS:ND1	1:D:149:PRO:CD	2.79	0.42
1:A:410:GLU:HA	1:A:414:LEU:HB2	2.01	0.42
1:B:256:LEU:HD11	1:B:285:HIS:CG	2.54	0.42
1:C:35:ILE:HD12	1:C:337:TRP:NE1	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:267:THR:O	1:C:267:THR:CG2	2.63	0.42
1:D:324:LEU:HD21	1:D:344:VAL:HG11	2.02	0.42
1:B:339:ILE:HG13	1:B:402:TRP:CH2	2.55	0.42
1:B:410:GLU:HB2	1:B:414:LEU:HD12	2.00	0.42
1:C:11:LYS:HG3	1:C:21:VAL:CG1	2.49	0.42
1:C:350:PHE:O	1:C:354:ILE:HD12	2.19	0.42
1:C:388:ASN:HD22	1:C:388:ASN:HA	1.66	0.42
1:A:402:TRP:O	1:A:406:ILE:HG12	2.20	0.42
1:D:133:THR:H	1:D:160:HIS:CE1	2.34	0.42
1:A:103:VAL:O	1:A:103:VAL:HG22	2.19	0.41
1:C:345:ILE:O	1:C:346:LYS:C	2.58	0.41
1:D:205:GLU:HG2	1:D:205:GLU:H	1.67	0.41
1:D:295:ASP:HB3	1:D:327:PHE:H	1.85	0.41
1:A:48:LEU:HB2	1:A:103:VAL:HB	2.02	0.41
1:B:158:ILE:HG23	1:B:210:ILE:HG22	2.03	0.41
1:D:363:GLN:OE1	1:D:371:ARG:NH1	2.47	0.41
1:A:87:LYS:HD2	3:A:523:HOH:O	2.21	0.41
1:D:288:ARG:HB3	1:D:296:HIS:HB2	2.02	0.41
1:A:357:LYS:CD	1:A:357:LYS:H	2.33	0.41
1:B:347:ALA:O	1:B:348:LEU:C	2.57	0.41
1:A:177:THR:O	1:A:178:PRO:C	2.59	0.41
1:A:350:PHE:HB2	1:A:383:LEU:HD22	2.03	0.41
1:B:217:GLU:HA	1:B:220:ASN:O	2.21	0.41
1:C:87:LYS:HB3	3:C:482:HOH:O	2.21	0.41
1:C:146:LEU:HD22	1:C:185:ILE:HG21	2.02	0.41
1:D:31:VAL:HA	1:D:32:PRO:HD2	1.74	0.41
1:D:63:TYR:HA	1:D:64:PRO:HD2	1.62	0.41
1:A:29:LYS:O	3:A:469:HOH:O	2.22	0.41
1:B:27:ARG:HA	1:B:27:ARG:HD2	1.82	0.41
1:B:198:THR:N	1:B:199:PRO:CD	2.84	0.41
1:B:267:THR:HG22	1:B:267:THR:O	2.20	0.41
1:D:36:HIS:NE2	1:D:326:PHE:O	2.53	0.41
1:B:35:ILE:HD12	1:B:337:TRP:CD1	2.56	0.40
1:C:137:HIS:CD2	1:C:139:LYS:H	2.17	0.40
1:D:111:PRO:HB3	1:D:170:TYR:CD2	2.56	0.40
1:D:324:LEU:HD13	1:D:326:PHE:HE2	1.85	0.40
1:A:298:VAL:CG1	1:A:304:LEU:HD22	2.51	0.40
1:C:69:THR:HG22	1:C:71:GLU:N	2.37	0.40
1:C:272:ILE:HG22	1:C:276:LEU:HD11	2.03	0.40
1:D:266:GLU:OE2	1:D:271:LYS:NZ	2.48	0.40
1:B:3:MET:CB	1:B:4:LYS:HD2	2.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:13:GLU:HA	1:A:16:GLN:HE21	1.83	0.40
1:B:410:GLU:HA	1:B:414:LEU:CG	2.52	0.40
1:B:216:ASN:HB3	1:B:219:TYR:CD2	2.57	0.40
1:C:133:THR:H	1:C:160:HIS:HE1	1.69	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:381:TYR:OH	1:D:400:GLU:OE2[1_655]	2.15	0.05

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	398/424 (94%)	365 (92%)	32 (8%)	1 (0%)	41	66
1	B	400/424 (94%)	371 (93%)	27 (7%)	2 (0%)	29	54
1	C	401/424 (95%)	374 (93%)	26 (6%)	1 (0%)	47	73
1	D	399/424 (94%)	372 (93%)	24 (6%)	3 (1%)	19	43
All	All	1598/1696 (94%)	1482 (93%)	109 (7%)	7 (0%)	34	60

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	265	THR
1	D	136	SER
1	C	259	THR
1	D	32	PRO
1	D	293	ASP
1	B	95	ILE

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Mol	Chain	Res	Type
1	A	43	VAL

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	352/370 (95%)	311 (88%)	41 (12%)	5	12
1	B	353/370 (95%)	297 (84%)	56 (16%)	2	6
1	C	354/370 (96%)	308 (87%)	46 (13%)	4	10
1	D	352/370 (95%)	304 (86%)	48 (14%)	3	8
All	All	1411/1480 (95%)	1220 (86%)	191 (14%)	4	9

All (191) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	GLU
1	A	9	ARG
1	A	30	GLN
1	A	31	VAL
1	A	43	VAL
1	A	48	LEU
1	A	81	LEU
1	A	93	HIS
1	A	99	THR
1	A	102	LYS
1	A	109	LEU
1	A	115	GLU
1	A	131	ASN
1	A	136	SER
1	A	145	THR
1	A	175	LEU
1	A	187	ASP
1	A	198	THR
1	A	199	PRO
1	A	227	LYS

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Mol	Chain	Res	Type
1	A	234	GLU
1	A	245	LEU
1	A	249	LEU
1	A	275	MET
1	A	276	LEU
1	A	277	LEU
1	A	279	HIS
1	A	280	ASP
1	A	286	VAL
1	A	295	ASP
1	A	315	ASP
1	A	321	LEU
1	A	338	THR
1	A	344	VAL
1	A	350	PHE
1	A	357	LYS
1	A	361	GLU
1	A	365	THR
1	A	370	ARG
1	A	401	GLU
1	A	403	LEU
1	B	2	SER
1	B	3	MET
1	B	4	LYS
1	B	9	ARG
1	B	12	ILE
1	B	16	GLN
1	B	21	VAL
1	B	27	ARG
1	B	28	LEU
1	B	35	ILE
1	B	41	ASP
1	B	62	ASP
1	B	66	LYS
1	B	79	LYS
1	B	82	SER
1	B	87	LYS
1	B	93	HIS
1	B	99	THR
1	B	100	ASP
1	B	102	LYS
1	B	103	VAL

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Mol	Chain	Res	Type
1	B	106	ARG
1	B	109	LEU
1	B	112	ARG
1	B	116	LYS
1	B	119	ARG
1	B	144	LEU
1	B	145	THR
1	B	151	GLN
1	B	173	LYS
1	B	181	THR
1	B	210	ILE
1	B	214	GLU
1	B	215	ILE
1	B	217	GLU
1	B	224	VAL
1	B	234	GLU
1	B	256	LEU
1	B	265	THR
1	B	267	THR
1	B	280	ASP
1	B	282	LEU
1	B	305	ARG
1	B	319	ARG
1	B	321	LEU
1	B	338	THR
1	B	341	THR
1	B	357	LYS
1	B	358	GLN
1	B	365	THR
1	B	370	ARG
1	B	374	VAL
1	B	383	LEU
1	B	401	GLU
1	B	403	LEU
1	B	411	LYS
1	C	4	LYS
1	C	12	ILE
1	C	21	VAL
1	C	31	VAL
1	C	35	ILE
1	C	48	LEU
1	C	49	SER

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Mol	Chain	Res	Type
1	C	66	LYS
1	C	79	LYS
1	C	81	LEU
1	C	87	LYS
1	C	102	LYS
1	C	103	VAL
1	C	109	LEU
1	C	115	GLU
1	C	139	LYS
1	C	141	LYS
1	C	144	LEU
1	C	146	LEU
1	C	151	GLN
1	C	234	GLU
1	C	237	VAL
1	C	250	LYS
1	C	253	LYS
1	C	264	PRO
1	C	267	THR
1	C	268	VAL
1	C	276	LEU
1	C	277	LEU
1	C	282	LEU
1	C	284	LEU
1	C	286	VAL
1	C	319	ARG
1	C	321	LEU
1	C	338	THR
1	C	344	VAL
1	C	353	LEU
1	C	354	ILE
1	C	358	GLN
1	C	359	LEU
1	C	398	ILE
1	C	401	GLU
1	C	403	LEU
1	C	404	LYS
1	C	414	LEU
1	C	416	GLN
1	D	4	LYS
1	D	5	SER
1	D	9	ARG

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Mol	Chain	Res	Type
1	D	12	ILE
1	D	27	ARG
1	D	29	LYS
1	D	31	VAL
1	D	35	ILE
1	D	43	VAL
1	D	50	LYS
1	D	75	MET
1	D	79	LYS
1	D	81	LEU
1	D	102	LYS
1	D	109	LEU
1	D	112	ARG
1	D	116	LYS
1	D	151	GLN
1	D	154	ARG
1	D	173	LYS
1	D	179	CYS
1	D	181	THR
1	D	187	ASP
1	D	205	GLU
1	D	231	ILE
1	D	245	LEU
1	D	246	SER
1	D	250	LYS
1	D	256	LEU
1	D	277	LEU
1	D	279	HIS
1	D	280	ASP
1	D	282	LEU
1	D	284	LEU
1	D	286	VAL
1	D	313	ARG
1	D	321	LEU
1	D	338	THR
1	D	344	VAL
1	D	364	GLU
1	D	374	VAL
1	D	392	GLU
1	D	400	GLU
1	D	401	GLU
1	D	403	LEU

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Mol	Chain	Res	Type
1	D	408	ILE
1	D	411	LYS
1	D	416	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	16	GLN
1	A	30	GLN
1	A	39	GLN
1	A	108	GLN
1	A	113	HIS
1	A	182	ASN
1	B	6	GLN
1	B	39	GLN
1	B	93	HIS
1	B	113	HIS
1	B	160	HIS
1	B	182	ASN
1	B	356	HIS
1	B	363	GLN
1	B	388	ASN
1	C	39	GLN
1	C	113	HIS
1	C	131	ASN
1	C	137	HIS
1	C	160	HIS
1	C	220	ASN
1	C	241	HIS
1	C	314	ASN
1	C	358	GLN
1	C	363	GLN
1	C	388	ASN
1	D	6	GLN
1	D	30	GLN
1	D	39	GLN
1	D	113	HIS
1	D	131	ASN
1	D	160	HIS
1	D	182	ASN
1	D	241	HIS
1	D	285	HIS

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Mol	Chain	Res	Type
1	D	314	ASN
1	D	356	HIS
1	D	388	ASN
1	D	416	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

5.4   Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6   Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 8 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 ⓘ

There are no such residues in this entry.

5.8   Polymer linkage issues ⓘ

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, 95th 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(Å²)	Q<0.9
1	A	402/424 (94%)	-0.58	1 (0%)	95	96	17, 29, 48, 68	0
1	B	404/424 (95%)	-0.52	2 (0%)	91	92	19, 32, 53, 77	0
1	C	405/424 (95%)	-0.58	3 (0%)	87	89	18, 31, 46, 84	0
1	D	403/424 (95%)	-0.50	2 (0%)	91	92	19, 31, 51, 72	0
All	All	1614/1696 (95%)	-0.55	8 (0%)	91	92	17, 31, 50, 84	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	3	MET	5.0
1	C	2	SER	4.2
1	B	415	LEU	2.7
1	A	49	SER	2.5
1	B	61	GLY	2.4
1	D	49	SER	2.2
1	C	49	SER	2.1
1	D	48	LEU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

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, 95th 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^2)	Q<0.9
2	MN	B	420	1/1	0.93	0.13	74,74,74,74	0
2	MN	D	420	1/1	0.93	0.17	75,75,75,75	0
2	MN	A	420	1/1	0.94	0.19	81,81,81,81	0
2	MN	C	419	1/1	0.94	0.14	81,81,81,81	0
2	MN	B	419	1/1	0.94	0.10	82,82,82,82	0
2	MN	A	419	1/1	0.95	0.07	69,69,69,69	0
2	MN	D	419	1/1	0.98	0.06	71,71,71,71	0
2	MN	C	420	1/1	0.98	0.14	67,67,67,67	0

6.5 Other polymers (i)

There are no such residues in this entry.