Full wwPDB X-ray Structure Validation Report ⓘ

May 26, 2020 – 10:41 pm BST

PDB ID	:	1QE0
Title	:	CRYSTAL STRUCTURE OF APO S. AUREUS HISTIDYL-TRNA SYNTHETASE
Authors	:	Qiu, X.; Janson, C.A.; Blackburn, M.N.; Chohan, I.K.; Hibbs, M.; Abdel-Meguid, S.S.
Deposited on	:	1999-07-12
Resolution	:	2.70 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

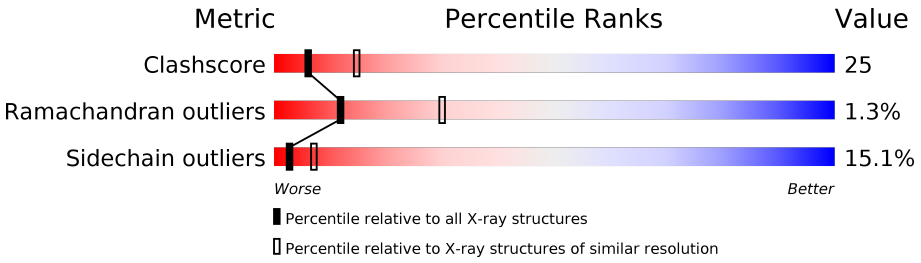
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.70 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (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 on 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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	420	49% 36% 7% 7%
1	B	420	43% 31% 7% 19%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5996 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 Histidine–tRNA ligase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	390	Total	C	N	O	S	0	0	0
			3150	2001	528	604	17			
1	B	342	Total	C	N	O	S	0	0	0
			2746	1747	455	530	14			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	201	ASP	ASN	conflict	UNP P60911
A	250	THR	ILE	conflict	UNP P60911
B	201	ASP	ASN	conflict	UNP P60911
B	250	THR	ILE	conflict	UNP P60911

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	50	Total	O	0	0
			50	50		
2	B	50	Total	O	0	0
			50	50		

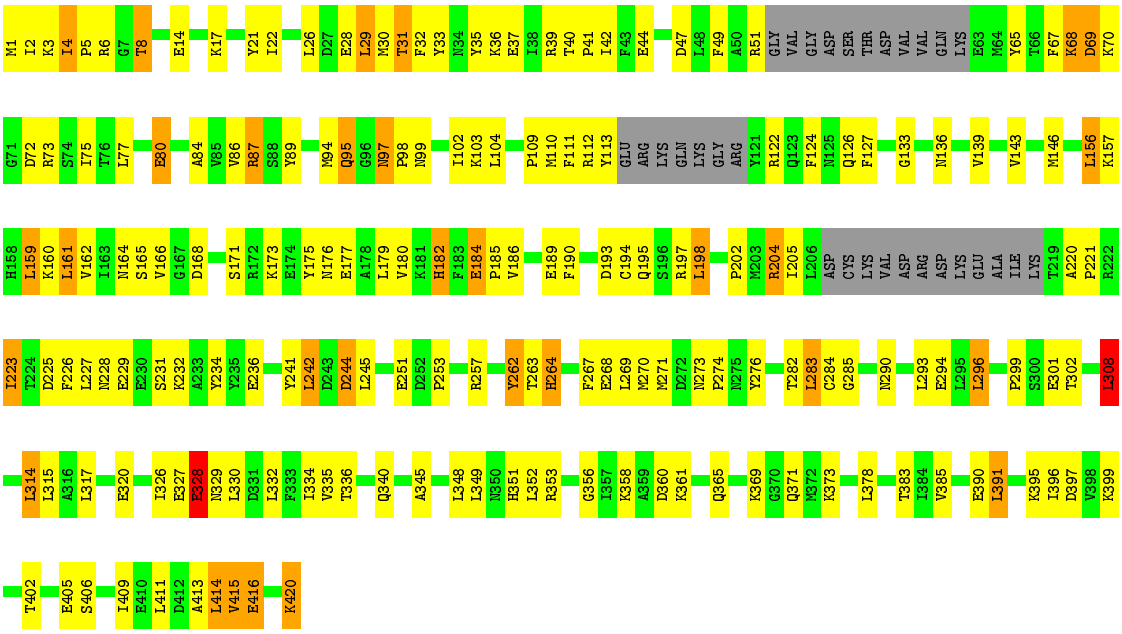
3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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.

Note EDS was not executed.

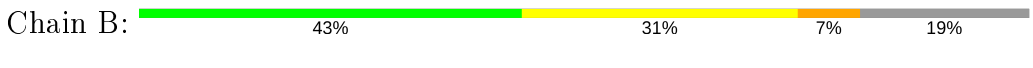
- Molecule 1: Histidine–tRNA ligase

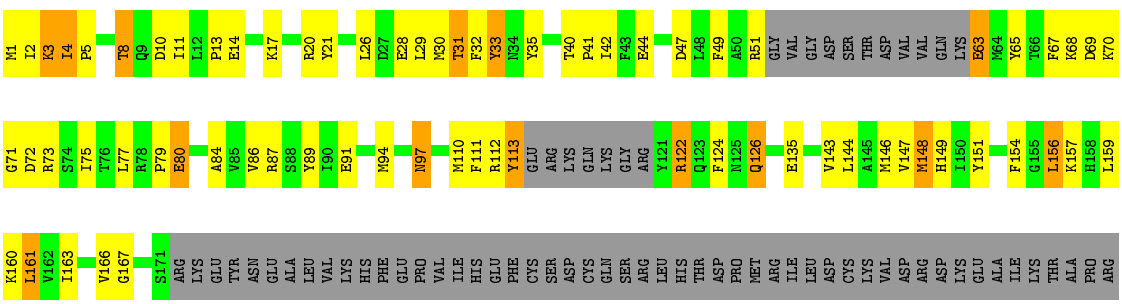
Chain A:

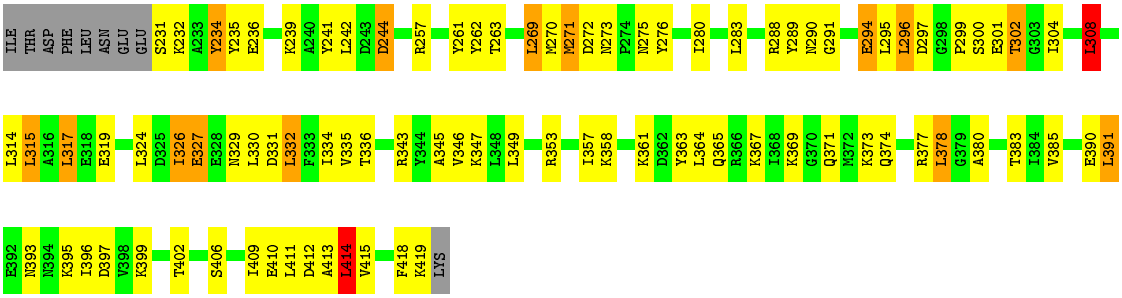


- Molecule 1: Histidine–tRNA ligase

Chain B:






ILE THR ASP PHE LEU ASN GLU GLU S231 K232 A233 Y234 Y235 E236 K239 A240 Y241 L242 D243 D244 R257 Y261 Y262 T263 L269 M270 M271 D272 N273 P274 N275 Y276 I280 L283 R288 Y289 N290 G291 E294 L295 L296 D297 G298 P299 S300 E301 T302 G303 I304 L308
L314 L315 A316 L317 E318 E319 L324 D325 I326 E327 E328 N329 L330 D331 L332 F333 I334 V335 T336 R343 Y344 A345 V346 K347 L348 L349 R353 I357 K358 K361 D362 Y363 L364 Q365 R366 K367 I368 K369 G370 Q371 M372 K373 Q374 R377 L378 G379 A380 T383 I384 V385 E390 L391
E392 N393 N394 K395 I396 D397 V398 K399 T402 S406 I409 E410 L411 D412 A413 L414 V415 F418 K419 LYS

4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α, β, γ	125.65Å 125.65Å 115.99Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	7.00 – 2.70	Depositor
% Data completeness (in resolution range)	70.0 (7.00-2.70)	Depositor
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.197 , 0.270	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5996	wwPDB-VP
Average B, all atoms (Å^2)	24.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

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	0.66	0/3210	0.85	2/4327 (0.0%)
1	B	0.65	0/2796	0.85	3/3770 (0.1%)
All	All	0.65	0/6006	0.85	5/8097 (0.1%)

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	B	0	1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	308	LEU	CA-CB-CG	8.05	133.81	115.30
1	B	308	LEU	CA-CB-CG	6.84	131.02	115.30
1	B	161	LEU	CA-CB-CG	5.23	127.33	115.30
1	A	161	LEU	CA-CB-CG	5.02	126.85	115.30
1	B	363	TYR	N-CA-C	-5.01	97.47	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	33	TYR	Sidechain

5.2 Too-close contacts (i)

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	3150	0	3097	167	0
1	B	2746	0	2698	163	0
2	A	50	0	0	0	0
2	B	50	0	0	4	0
All	All	5996	0	5795	288	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 25.

All (288) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:232:LYS:O	1:A:236:GLU:HG2	1.64	0.97
1:B:4:ILE:HG23	1:B:8:THR:HG22	1.47	0.97
1:B:44:GLU:HB2	1:B:49:PHE:HE2	1.42	0.83
1:B:257:ARG:HD3	1:B:262:TYR:CE2	2.13	0.82
1:B:40:THR:HG21	1:B:84:ALA:HB1	1.64	0.79
1:A:182:HIS:O	1:A:185:PRO:HD2	1.84	0.78
1:A:273:ASN:HB3	1:A:276:TYR:CD2	2.19	0.78
1:A:180:VAL:O	1:A:184:GLU:HB3	1.85	0.76
1:B:44:GLU:HB2	1:B:49:PHE:CE2	2.20	0.75
1:A:113:TYR:HE1	1:B:70:LYS:HA	1.52	0.74
1:A:44:GLU:HB2	1:A:49:PHE:CE2	2.22	0.74
1:B:334:ILE:HD12	1:B:349:LEU:HD13	1.71	0.72
1:A:40:THR:HG21	1:A:84:ALA:HB1	1.71	0.71
1:B:4:ILE:CG2	1:B:8:THR:HG22	2.21	0.71
1:B:5:PRO:HD2	1:B:8:THR:HG21	1.73	0.70
1:B:393:ASN:HB3	1:B:395:LYS:HG2	1.73	0.69
1:A:175:TYR:CE1	1:A:179:LEU:HD11	2.27	0.69
1:A:44:GLU:HB2	1:A:49:PHE:HE2	1.57	0.68
1:A:351:HIS:ND1	1:A:415:VAL:HG21	2.09	0.68
1:A:352:LEU:HD23	1:A:415:VAL:HG13	1.75	0.67
1:B:273:ASN:HB3	1:B:276:TYR:CE2	2.30	0.67
1:B:89:TYR:OH	1:B:301:GLU:HG3	1.95	0.67
1:A:166:VAL:HG12	1:A:223:ILE:HG21	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:80:GLU:HB3	1:A:112:ARG:HH21	1.60	0.66
1:A:263:THR:HG22	1:A:264:HIS:H	1.60	0.66
1:B:294:GLU:OE2	1:B:300:SER:HA	1.97	0.65
1:A:2:ILE:HD11	1:B:51:ARG:NH1	2.10	0.65
1:B:31:THR:HG22	1:B:32:PHE:CD2	2.31	0.65
1:B:65:TYR:HB2	1:B:77:LEU:HB2	1.79	0.65
1:B:4:ILE:HD11	1:B:10:ASP:OD1	1.96	0.64
1:B:73:ARG:NH2	2:B:2069:HOH:O	2.31	0.64
1:A:179:LEU:HD13	1:A:202:PRO:HB2	1.80	0.64
1:B:257:ARG:HD3	1:B:262:TYR:CD2	2.33	0.64
1:A:334:ILE:HD12	1:A:349:LEU:HD13	1.79	0.63
1:A:40:THR:HG21	1:A:84:ALA:CB	2.28	0.63
1:A:220:ALA:HB1	1:A:221:PRO:HD2	1.81	0.63
1:A:358:LYS:HG2	1:B:31:THR:HG23	1.80	0.63
1:B:26:LEU:O	1:B:30:MET:HG2	1.99	0.62
1:B:148:MET:SD	1:B:269:LEU:HD21	2.39	0.62
1:A:87:ARG:CZ	1:B:4:ILE:HG13	2.30	0.62
1:A:67:PHE:CE1	1:A:75:ILE:HD11	2.34	0.62
1:B:28:GLU:O	1:B:31:THR:HB	1.99	0.62
1:A:28:GLU:O	1:A:31:THR:HB	2.00	0.61
1:A:67:PHE:HD1	1:A:69:ASP:CG	2.04	0.61
1:A:41:PRO:HG2	1:B:8:THR:CG2	2.31	0.61
1:B:273:ASN:HB3	1:B:276:TYR:HE2	1.65	0.60
1:B:280:ILE:HD12	1:B:280:ILE:O	2.00	0.60
1:A:97:ASN:ND2	1:A:98:PRO:HD2	2.17	0.60
1:B:390:GLU:HG2	1:B:396:ILE:HG22	1.84	0.60
1:A:168:ASP:HA	1:A:263:THR:CG2	2.32	0.59
1:B:33:TYR:OH	1:B:149:HIS:HD2	1.85	0.59
1:A:70:LYS:HG2	2:B:2093:HOH:O	2.02	0.59
1:A:51:ARG:CZ	1:B:2:ILE:HD11	2.32	0.59
1:A:127:PHE:HB3	1:A:308:LEU:HD22	1.84	0.59
1:B:257:ARG:HH11	1:B:262:TYR:HE2	1.46	0.59
1:A:86:VAL:HG11	1:A:296:LEU:HD23	1.85	0.59
1:A:369:LYS:HG2	1:A:373:LYS:HE3	1.84	0.59
1:A:1:MET:HA	1:B:297:ASP:HB2	1.83	0.58
1:B:94:MET:O	1:B:97:ASN:HB2	2.03	0.58
1:B:68:LYS:O	1:B:72:ASP:HA	2.03	0.58
1:B:156:LEU:CD1	1:B:317:LEU:HD13	2.34	0.58
1:A:110:MET:HG3	1:A:126:GLN:HG2	1.85	0.58
1:A:396:ILE:HD11	1:A:414:LEU:CD2	2.34	0.57
1:A:41:PRO:CG	1:B:8:THR:HG23	2.35	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:97:ASN:HD22	1:A:98:PRO:HD2	1.68	0.57
1:A:330:LEU:HD21	1:A:360:ASP:HB2	1.86	0.57
1:B:396:ILE:HD11	1:B:414:LEU:CD2	2.35	0.57
1:B:232:LYS:O	1:B:236:GLU:HG2	2.04	0.57
1:A:98:PRO:HG2	1:B:377:ARG:HD2	1.86	0.56
1:A:41:PRO:HG2	1:B:8:THR:HG23	1.86	0.56
1:A:111:PHE:HZ	1:B:42:ILE:HG13	1.70	0.56
1:A:51:ARG:NH1	1:B:2:ILE:HD11	2.20	0.56
1:B:396:ILE:CG1	1:B:411:LEU:HD12	2.35	0.56
1:B:40:THR:HG21	1:B:84:ALA:CB	2.33	0.56
1:A:95:GLN:H	1:A:95:GLN:NE2	2.03	0.56
1:A:3:LYS:HG2	1:B:91:GLU:OE1	2.05	0.56
1:A:335:VAL:O	1:A:385:VAL:HA	2.06	0.56
1:A:110:MET:CG	1:A:126:GLN:HG2	2.36	0.56
1:B:357:ILE:HG12	1:B:418:PHE:HB3	1.87	0.55
1:A:175:TYR:CD1	1:A:223:ILE:HG12	2.41	0.55
1:B:167:GLY:O	1:B:263:THR:O	2.24	0.55
1:B:231:SER:O	1:B:234:TYR:N	2.39	0.55
1:A:358:LYS:HA	1:B:32:PHE:HA	1.88	0.55
1:B:86:VAL:HG11	1:B:296:LEU:HD23	1.88	0.55
1:B:409:ILE:HD12	1:B:413:ALA:HB3	1.88	0.55
1:A:94:MET:O	1:A:97:ASN:HB2	2.07	0.55
1:A:8:THR:CG2	1:B:41:PRO:HG2	2.35	0.55
1:B:276:TYR:CZ	1:B:319:GLU:HG3	2.42	0.55
1:A:251:GLU:O	1:A:253:PRO:HD3	2.07	0.54
1:A:136:ASN:HB3	1:A:139:VAL:HG23	1.89	0.54
1:B:324:LEU:HB2	1:B:326:ILE:HG12	1.90	0.54
1:B:49:PHE:CE1	1:B:79:PRO:HD2	2.42	0.54
1:A:197:ARG:CD	1:A:204:ARG:HB3	2.38	0.54
1:B:151:TYR:OH	1:B:308:LEU:HG	2.08	0.54
1:A:89:TYR:OH	1:A:301:GLU:HG3	2.08	0.54
1:B:335:VAL:HA	1:B:371:GLN:OE1	2.08	0.54
1:A:164:ASN:ND2	1:A:165:SER:H	2.05	0.53
1:B:330:LEU:HB3	1:B:380:ALA:HA	1.90	0.53
1:A:173:LYS:O	1:A:177:GLU:HG3	2.09	0.53
1:A:65:TYR:HB2	1:A:77:LEU:HB2	1.91	0.53
1:A:31:THR:HG23	1:B:358:LYS:HG2	1.90	0.53
1:B:409:ILE:HD11	1:B:414:LEU:HD22	1.90	0.53
1:B:4:ILE:HG23	1:B:8:THR:CG2	2.30	0.53
1:A:198:LEU:O	1:A:202:PRO:HG3	2.08	0.53
1:B:257:ARG:NH1	1:B:262:TYR:HE2	2.07	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:369:LYS:O	1:A:373:LYS:HG3	2.08	0.53
1:B:14:GLU:HG2	1:B:14:GLU:O	2.09	0.53
1:B:14:GLU:O	1:B:17:LYS:HE2	2.08	0.52
1:B:241:TYR:O	1:B:244:ASP:HB2	2.09	0.52
1:B:151:TYR:CD2	1:B:269:LEU:HD12	2.43	0.52
1:A:358:LYS:CG	1:B:31:THR:HG23	2.38	0.52
1:A:8:THR:HG23	1:B:41:PRO:CG	2.40	0.52
1:A:263:THR:HG22	1:A:264:HIS:N	2.24	0.52
1:A:175:TYR:HD2	1:A:226:PHE:CD2	2.27	0.52
1:A:273:ASN:O	1:A:276:TYR:HB2	2.10	0.52
1:B:331:ASP:HB2	1:B:358:LYS:O	2.09	0.52
1:A:180:VAL:HA	1:A:198:LEU:HD21	1.92	0.52
1:B:374:GLN:HG3	1:B:378:LEU:HD22	1.91	0.52
1:B:396:ILE:HG13	1:B:411:LEU:HD12	1.92	0.51
1:A:190:PHE:HB3	1:A:194:CYS:HB2	1.92	0.51
1:A:329:ASN:O	1:A:358:LYS:HE2	2.09	0.51
1:B:156:LEU:HD11	1:B:317:LEU:HD13	1.92	0.51
1:A:336:THR:HG21	1:A:345:ALA:HB2	1.92	0.51
1:A:113:TYR:CE1	1:B:70:LYS:HA	2.40	0.51
1:A:273:ASN:HB3	1:A:276:TYR:CE2	2.46	0.51
1:A:202:PRO:O	1:A:205:ILE:HB	2.11	0.51
1:B:110:MET:HG3	1:B:126:GLN:HG2	1.92	0.51
1:A:190:PHE:O	1:A:195:GLN:HG3	2.10	0.51
1:A:6:ARG:NH2	2:B:2069:HOH:O	2.43	0.51
1:B:336:THR:HG21	1:B:345:ALA:HB2	1.92	0.51
1:A:180:VAL:HG22	1:A:198:LEU:HD22	1.93	0.51
1:A:330:LEU:HD21	1:A:360:ASP:CB	2.41	0.51
1:B:273:ASN:ND2	1:B:276:TYR:CE2	2.79	0.51
1:A:36:LYS:HB3	1:B:13:PRO:HB3	1.94	0.50
1:B:166:VAL:HG23	1:B:263:THR:O	2.12	0.50
1:A:197:ARG:HD2	1:A:204:ARG:HB3	1.93	0.50
1:B:160:LYS:HB3	1:B:270:MET:HB2	1.93	0.50
1:B:410:GLU:OE1	1:B:412:ASP:HB2	2.11	0.50
1:B:276:TYR:OH	1:B:319:GLU:HG3	2.12	0.50
1:B:135:GLU:HG2	1:B:234:TYR:HE2	1.77	0.50
1:B:67:PHE:CE1	1:B:75:ILE:HD11	2.47	0.49
1:A:271:MET:HG2	1:A:276:TYR:HE2	1.76	0.49
1:B:63:GLU:O	1:B:113:TYR:HB2	2.12	0.49
1:A:184:GLU:HB2	1:A:198:LEU:HD11	1.94	0.49
1:A:29:LEU:O	1:A:33:TYR:HD2	1.96	0.49
1:B:161:LEU:CD1	1:B:163:ILE:HG23	2.43	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:68:LYS:O	1:A:72:ASP:HA	2.13	0.49
1:A:5:PRO:HD2	1:A:8:THR:HG21	1.94	0.49
1:B:235:TYR:CZ	1:B:239:LYS:HD3	2.47	0.49
1:B:144:LEU:O	1:B:147:VAL:HG12	2.13	0.49
1:B:21:TYR:CB	1:B:326:ILE:HD11	2.43	0.49
1:A:284:CYS:SG	1:A:285:GLY:N	2.85	0.49
1:B:80:GLU:HB3	1:B:112:ARG:HH21	1.77	0.48
1:A:171:SER:HB3	1:A:226:PHE:O	2.12	0.48
1:A:8:THR:HG23	1:B:41:PRO:HG2	1.95	0.48
1:A:32:PHE:HA	1:B:358:LYS:HA	1.95	0.48
1:A:352:LEU:HD23	1:A:415:VAL:CG1	2.42	0.48
1:A:168:ASP:HA	1:A:263:THR:HG23	1.96	0.48
1:B:21:TYR:CE1	1:B:324:LEU:HD22	2.48	0.48
1:A:26:LEU:O	1:A:30:MET:HG2	2.14	0.48
1:A:271:MET:HE3	1:A:283:LEU:HD21	1.95	0.48
1:B:49:PHE:CD1	1:B:79:PRO:HD2	2.48	0.48
1:A:70:LYS:O	1:A:73:ARG:HG3	2.14	0.48
1:B:335:VAL:HG13	1:B:371:GLN:OE1	2.14	0.48
1:A:349:LEU:HD12	1:A:349:LEU:HA	1.61	0.47
1:B:110:MET:CG	1:B:126:GLN:HG2	2.44	0.47
1:B:280:ILE:C	1:B:280:ILE:HD12	2.35	0.47
1:A:175:TYR:CE1	1:A:223:ILE:HG12	2.49	0.47
1:A:87:ARG:NH2	1:B:4:ILE:HG13	2.29	0.47
1:A:14:GLU:O	1:A:17:LYS:HE2	2.15	0.47
1:A:37:GLU:HB3	1:B:20:ARG:NH2	2.29	0.47
1:A:241:TYR:OH	1:B:343:ARG:HG2	2.15	0.47
1:A:89:TYR:HA	1:A:94:MET:SD	2.53	0.47
1:B:349:LEU:O	1:B:353:ARG:HG3	2.14	0.47
1:B:395:LYS:O	1:B:395:LYS:HG3	2.14	0.47
1:A:182:HIS:CE1	1:A:220:ALA:HB2	2.49	0.47
1:A:351:HIS:CE1	1:A:415:VAL:HG21	2.49	0.47
1:A:340:GLN:HG2	1:A:391:LEU:HD23	1.97	0.47
1:A:390:GLU:HG2	1:A:396:ILE:HG22	1.96	0.47
1:A:69:ASP:HB3	1:B:113:TYR:OH	2.15	0.47
1:B:272:ASP:HA	1:B:280:ILE:HA	1.97	0.47
1:B:63:GLU:C	1:B:113:TYR:HB2	2.35	0.47
1:A:175:TYR:HB2	1:A:226:PHE:CG	2.49	0.47
1:B:21:TYR:HB2	1:B:326:ILE:HD11	1.97	0.47
1:B:396:ILE:HG12	1:B:411:LEU:HD12	1.97	0.47
1:B:5:PRO:O	1:B:8:THR:HB	2.15	0.47
1:B:273:ASN:ND2	1:B:275:ASN:HB2	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:22:ILE:HD11	1:A:314:LEU:HD13	1.98	0.46
1:B:335:VAL:O	1:B:385:VAL:HA	2.15	0.46
1:A:273:ASN:HA	1:A:274:PRO:HD2	1.72	0.46
1:B:21:TYR:CD1	1:B:324:LEU:HD22	2.51	0.46
1:A:36:LYS:CB	1:B:13:PRO:HB3	2.46	0.46
1:B:111:PHE:CD2	1:B:111:PHE:N	2.83	0.45
1:B:271:MET:O	1:B:280:ILE:HA	2.16	0.45
1:A:245:LEU:HD23	1:B:347:LYS:HA	1.98	0.45
1:A:356:GLY:HA2	1:B:32:PHE:CZ	2.52	0.45
1:A:22:ILE:CD1	1:A:314:LEU:HD13	2.47	0.45
1:A:21:TYR:CG	1:A:326:ILE:HD11	2.51	0.45
1:B:410:GLU:HG3	1:B:413:ALA:H	1.82	0.45
1:A:39:ARG:HB2	1:B:11:ILE:HB	1.99	0.45
1:B:21:TYR:HB2	1:B:326:ILE:CD1	2.46	0.45
1:A:335:VAL:HA	1:A:371:GLN:OE1	2.17	0.45
1:A:35:TYR:CE2	1:A:146:MET:HE1	2.52	0.45
1:B:399:LYS:HA	1:B:406:SER:HA	1.98	0.44
1:B:273:ASN:HB3	1:B:276:TYR:CD2	2.53	0.44
1:A:257:ARG:HD3	1:A:262:TYR:CE2	2.52	0.44
1:B:156:LEU:HD13	1:B:317:LEU:HD13	1.98	0.44
1:A:242:LEU:HA	1:A:242:LEU:HD12	1.79	0.44
1:A:51:ARG:HG3	1:A:296:LEU:CD1	2.48	0.44
1:A:186:VAL:HB	1:A:189:GLU:CD	2.38	0.44
1:A:241:TYR:O	1:A:244:ASP:HB2	2.18	0.44
1:B:32:PHE:N	1:B:32:PHE:CD2	2.85	0.44
1:A:4:ILE:HG21	1:A:4:ILE:HD13	1.63	0.44
1:A:228:ASN:ND2	1:A:231:SER:OG	2.51	0.43
1:A:334:ILE:HD12	1:A:349:LEU:CD1	2.48	0.43
1:A:399:LYS:HA	1:A:406:SER:HA	2.00	0.43
1:B:291:GLY:O	1:B:295:LEU:HG	2.18	0.43
1:B:70:LYS:HB3	1:B:73:ARG:HB2	2.00	0.43
1:A:349:LEU:O	1:A:353:ARG:HG3	2.18	0.43
1:A:5:PRO:O	1:A:8:THR:HB	2.18	0.43
1:B:369:LYS:HG2	1:B:373:LYS:HE3	2.01	0.43
1:A:35:TYR:CE2	1:A:103:LYS:HE2	2.53	0.43
1:A:2:ILE:HD11	1:B:51:ARG:CZ	2.48	0.43
1:B:73:ARG:CZ	2:B:2069:HOH:O	2.65	0.43
1:A:334:ILE:HD13	1:A:348:LEU:HD23	1.99	0.43
1:B:35:TYR:CE2	1:B:146:MET:HE3	2.53	0.43
1:A:1:MET:HE1	1:B:91:GLU:HG3	2.00	0.43
1:A:156:LEU:HD12	1:A:320:GLU:HG3	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:326:ILE:HG22	1:B:327:GLU:N	2.33	0.43
1:B:391:LEU:HD12	1:B:391:LEU:HA	1.83	0.43
1:A:413:ALA:O	1:A:414:LEU:C	2.57	0.43
1:A:6:ARG:O	1:B:70:LYS:HE3	2.18	0.43
1:A:31:THR:CG2	1:B:358:LYS:HG2	2.48	0.43
1:B:31:THR:HG22	1:B:32:PHE:HD2	1.83	0.43
1:B:1:MET:CE	1:B:3:LYS:HE2	2.49	0.43
1:A:1:MET:HA	1:B:297:ASP:CB	2.49	0.43
1:A:99:ASN:HB2	1:B:377:ARG:HG2	2.00	0.42
1:B:63:GLU:HB3	1:B:113:TYR:CD2	2.54	0.42
1:A:299:PRO:HB2	1:A:301:GLU:HG2	2.01	0.42
1:A:420:LYS:HB3	1:A:420:LYS:HE3	1.68	0.42
1:B:273:ASN:CB	1:B:276:TYR:HE2	2.32	0.42
1:B:288:ARG:HH21	1:B:302:THR:HB	1.84	0.42
1:A:268:GLU:HG2	1:A:282:THR:CG2	2.49	0.42
1:A:271:MET:HE2	1:A:271:MET:HB2	1.76	0.42
1:A:227:LEU:HD23	1:A:227:LEU:N	2.34	0.42
1:A:409:ILE:HD11	1:A:414:LEU:HD22	2.01	0.42
1:A:40:THR:CG2	1:A:84:ALA:HB1	2.46	0.42
1:A:87:ARG:NH2	1:B:10:ASP:OD2	2.51	0.42
1:B:124:PHE:N	1:B:124:PHE:CD1	2.88	0.42
1:B:299:PRO:HB2	1:B:301:GLU:HG2	2.01	0.42
1:B:331:ASP:OD1	1:B:358:LYS:HD3	2.19	0.42
1:B:67:PHE:HD1	1:B:69:ASP:CG	2.22	0.42
1:B:71:GLY:C	1:B:73:ARG:H	2.21	0.42
1:A:133:GLY:O	1:B:364:LEU:HD11	2.20	0.41
1:A:176:ASN:HA	1:A:179:LEU:HD12	2.02	0.41
1:A:21:TYR:HB2	1:A:326:ILE:CD1	2.50	0.41
1:A:245:LEU:HD21	1:B:346:VAL:HG12	2.02	0.41
1:A:349:LEU:HD22	1:A:361:LYS:HD2	2.02	0.41
1:A:335:VAL:HB	1:A:385:VAL:HA	2.00	0.41
1:A:391:LEU:HD12	1:A:391:LEU:HA	1.82	0.41
1:A:70:LYS:HB3	1:A:73:ARG:HB2	2.02	0.41
1:B:315:LEU:HD22	1:B:315:LEU:O	2.19	0.41
1:B:154:PHE:HB3	1:B:317:LEU:HD11	2.01	0.41
1:A:102:ILE:HG22	1:A:104:LEU:HG	2.02	0.41
1:A:17:LYS:HD2	1:A:328:GLU:HG3	2.02	0.41
1:A:37:GLU:HB3	1:B:20:ARG:HH22	1.85	0.41
1:A:416:GLU:HA	1:A:416:GLU:OE2	2.20	0.41
1:A:42:ILE:HG13	1:B:111:PHE:HZ	1.85	0.41
1:B:349:LEU:HD22	1:B:361:LYS:HD2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:367:LYS:HG3	1:B:367:LYS:H	1.72	0.41
1:A:159:LEU:HA	1:A:159:LEU:HD12	1.92	0.41
1:B:332:LEU:HG	1:B:418:PHE:CZ	2.56	0.41
1:B:4:ILE:HD13	1:B:4:ILE:HG21	1.70	0.41
1:A:180:VAL:HA	1:A:198:LEU:CD2	2.50	0.41
1:B:40:THR:HG23	1:B:41:PRO:HD2	2.02	0.41
1:B:272:ASP:HB3	1:B:280:ILE:HG22	2.02	0.41
1:B:413:ALA:O	1:B:414:LEU:C	2.59	0.41
1:A:67:PHE:HD1	1:A:69:ASP:OD2	2.04	0.41
1:B:288:ARG:HA	1:B:304:ILE:HA	2.03	0.41
1:A:3:LYS:HA	1:B:91:GLU:OE1	2.21	0.41
1:A:109:PRO:HA	1:A:124:PHE:O	2.21	0.40
1:A:162:VAL:O	1:A:267:PHE:HA	2.22	0.40
1:A:414:LEU:HA	1:A:414:LEU:HD13	1.89	0.40
1:B:65:TYR:OH	1:B:122:ARG:HG2	2.21	0.40
1:A:327:GLU:O	1:A:327:GLU:HG2	2.21	0.40
1:B:261:TYR:O	1:B:289:TYR:HA	2.21	0.40
1:A:175:TYR:HB2	1:A:226:PHE:CB	2.51	0.40
1:A:369:LYS:HE2	1:A:373:LYS:HE3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	382/420 (91%)	339 (89%)	38 (10%)	5 (1%)	12	30
1	B	334/420 (80%)	300 (90%)	30 (9%)	4 (1%)	13	32
All	All	716/840 (85%)	639 (89%)	68 (10%)	9 (1%)	12	30

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	328	GLU
1	A	193	ASP
1	A	365	GLN
1	B	365	GLN
1	B	326	ILE
1	B	327	GLU
1	A	182	HIS
1	A	264	HIS
1	B	414	LEU

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	340/368 (92%)	286 (84%)	54 (16%)	2 6
1	B	294/368 (80%)	252 (86%)	42 (14%)	3 8
All	All	634/736 (86%)	538 (85%)	96 (15%)	3 7

All (96) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ILE
1	A	8	THR
1	A	29	LEU
1	A	31	THR
1	A	47	ASP
1	A	68	LYS
1	A	69	ASP
1	A	80	GLU
1	A	87	ARG
1	A	95	GLN
1	A	97	ASN
1	A	122	ARG
1	A	143	VAL
1	A	156	LEU
1	A	157	LYS

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Mol	Chain	Res	Type
1	A	159	LEU
1	A	160	LYS
1	A	161	LEU
1	A	184	GLU
1	A	198	LEU
1	A	204	ARG
1	A	223	ILE
1	A	225	ASP
1	A	229	GLU
1	A	234	TYR
1	A	242	LEU
1	A	244	ASP
1	A	262	TYR
1	A	269	LEU
1	A	270	MET
1	A	283	LEU
1	A	290	ASN
1	A	293	LEU
1	A	294	GLU
1	A	296	LEU
1	A	302	THR
1	A	308	LEU
1	A	314	LEU
1	A	315	LEU
1	A	317	LEU
1	A	328	GLU
1	A	332	LEU
1	A	378	LEU
1	A	383	THR
1	A	391	LEU
1	A	395	LYS
1	A	397	ASP
1	A	402	THR
1	A	405	GLU
1	A	411	LEU
1	A	414	LEU
1	A	415	VAL
1	A	416	GLU
1	A	420	LYS
1	B	3	LYS
1	B	4	ILE
1	B	8	THR

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Mol	Chain	Res	Type
1	B	29	LEU
1	B	31	THR
1	B	47	ASP
1	B	63	GLU
1	B	80	GLU
1	B	87	ARG
1	B	97	ASN
1	B	113	TYR
1	B	122	ARG
1	B	126	GLN
1	B	143	VAL
1	B	148	MET
1	B	156	LEU
1	B	157	LYS
1	B	159	LEU
1	B	234	TYR
1	B	242	LEU
1	B	244	ASP
1	B	269	LEU
1	B	271	MET
1	B	283	LEU
1	B	290	ASN
1	B	294	GLU
1	B	296	LEU
1	B	302	THR
1	B	308	LEU
1	B	314	LEU
1	B	315	LEU
1	B	317	LEU
1	B	329	ASN
1	B	332	LEU
1	B	378	LEU
1	B	383	THR
1	B	391	LEU
1	B	397	ASP
1	B	402	THR
1	B	414	LEU
1	B	415	VAL
1	B	419	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	GLN
1	A	95	GLN
1	A	97	ASN
1	A	164	ASN
1	A	237	GLN
1	A	340	GLN
1	A	354	HIS
1	A	365	GLN
1	B	9	GLN
1	B	149	HIS
1	B	164	ASN
1	B	237	GLN
1	B	273	ASN
1	B	275	ASN
1	B	329	ASN
1	B	340	GLN
1	B	354	HIS
1	B	365	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 carbohydrates in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.