



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 09:57 PM UTC

PDB ID : 1BS2 / pdb\_00001bs2  
Title : YEAST ARGINYL-TRNA SYNTHETASE  
Authors : Cavarelli, J.; Delagouute, B.; Eriani, G.; Gangloff, J.; Moras, D.  
Deposited on : 1998-08-31  
Resolution : 2.75 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	NOT EXECUTED
Xtriage (Phenix)	:	2.0
EDS	:	NOT EXECUTED
Buster-report	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

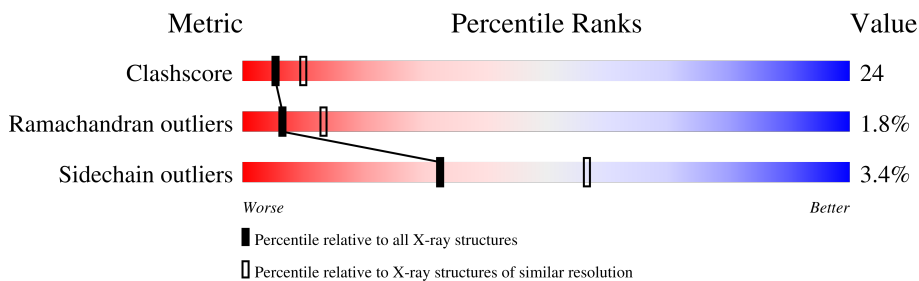
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.75 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	190562	1044 (2.76-2.76)
Ramachandran outliers	187476	1024 (2.76-2.76)
Sidechain outliers	187428	1024 (2.76-2.76)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	607	 57% 39% . .

## 2 Entry composition [i](#)

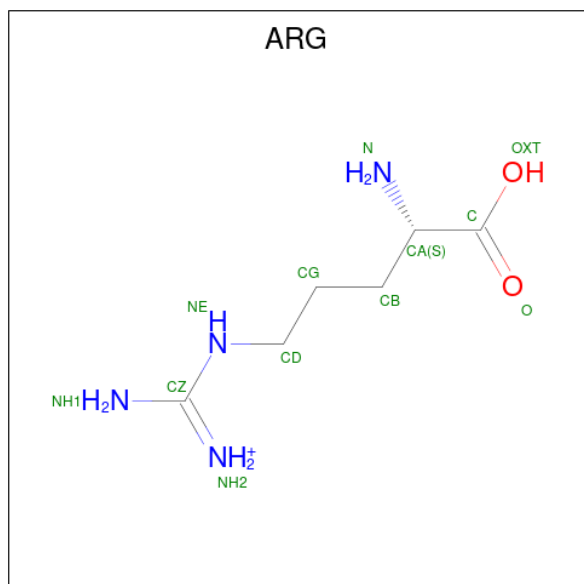
There are 3 unique types of molecules in this entry. The entry contains 5157 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 PROTEIN (ARGINYL-TRNA SYNTHETASE).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	603	Total	C	N	O	S	0	0	0
			4874	3128	825	900	21			

- Molecule 2 is ARGinine (CCD ID: ARG) (formula:  $C_6H_{15}N_4O_2$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			12	6	4	2		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	271	Total	O	0	0
			271	271		

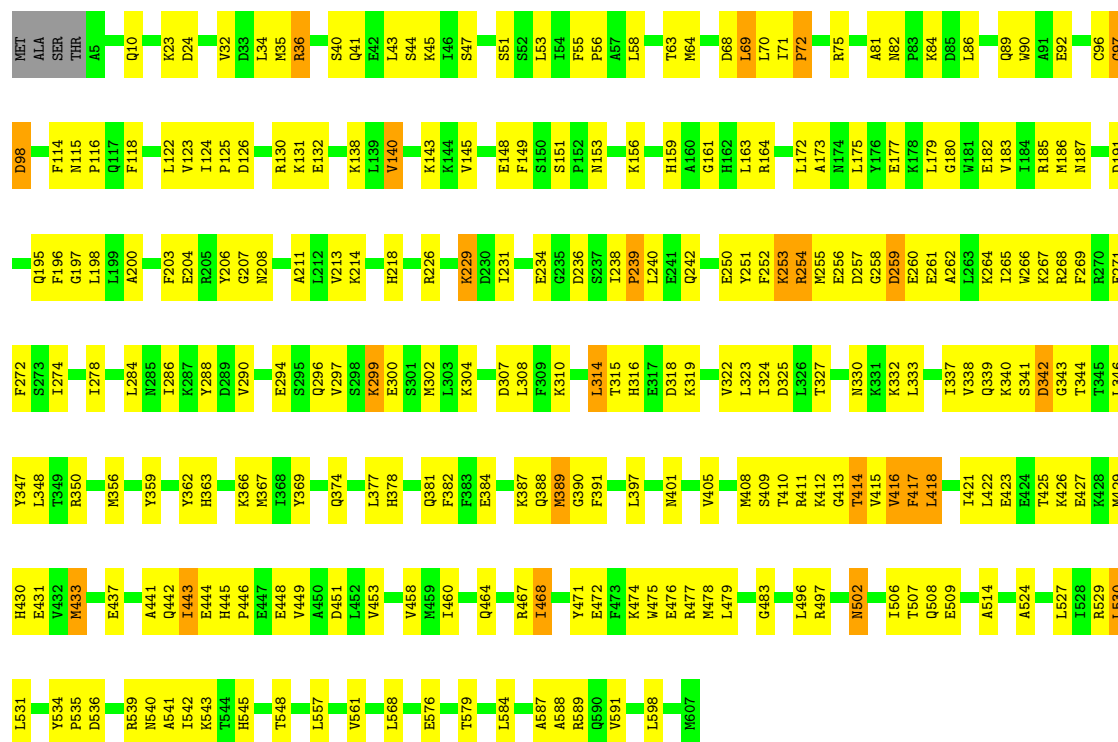
### 3 Residue-property plots

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.

Note EDS was not executed.

#### • Molecule 1: PROTEIN (ARGINYL-TRNA SYNTHETASE)

Chain A:  57% 39%



## 4 Data and refinement statistics

EDS was not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	100.37Å 100.37Å 204.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.75	Depositor
% Data completeness (in resolution range)	97.3 (20.00-2.75)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.04	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	5.91 (at 2.76Å)	Xtriage
Refinement program	CNS 0.1-0.4	Depositor
R, $R_{free}$	0.207 , 0.269	Depositor
Wilson B-factor (Å <sup>2</sup> )	48.7	Xtriage
Anisotropy	0.486	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5157	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality

### 5.1 Standard geometry

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	0.41	0/4978	0.94	15/6711 (0.2%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	123	VAL	N-CA-C	8.06	118.16	110.42
1	A	197	GLY	N-CA-C	-7.51	103.78	112.50
1	A	254	ARG	N-CA-C	-7.13	103.61	114.16
1	A	255	MET	N-CA-C	-6.26	104.70	112.90
1	A	72	PRO	N-CA-C	-6.24	100.38	110.74
1	A	183	VAL	N-CA-C	6.13	116.75	108.17
1	A	234	GLU	CB-CA-C	-6.10	108.29	117.07
1	A	269	PHE	N-CA-C	-5.91	104.74	111.07
1	A	416	VAL	N-CA-C	-5.91	100.45	109.78
1	A	242	GLN	N-CA-C	-5.74	106.05	113.16
1	A	180	GLY	N-CA-C	5.64	122.25	114.92
1	A	182	GLU	N-CA-C	-5.35	100.01	108.73
1	A	389	MET	N-CA-C	-5.34	106.73	113.20
1	A	314	LEU	N-CA-C	-5.29	107.47	114.04
1	A	34	LEU	N-CA-C	-5.02	105.70	111.07

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	4874	0	4889	234	0
2	A	12	0	12	1	0
3	A	271	0	0	12	0
All	All	5157	0	4901	234	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 24.

All (234) 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:468:ILE:H	1:A:468:ILE:HD12	1.17	1.10
1:A:442:GLN:HA	3:A:1132:HOH:O	1.58	1.03
1:A:417:PHE:HD1	1:A:418:LEU:H	1.25	0.85
1:A:468:ILE:H	1:A:468:ILE:CD1	1.91	0.82
1:A:226:ARG:HG2	1:A:229:LYS:NZ	1.97	0.79
1:A:464:GLN:O	1:A:548:THR:HG23	1.83	0.78
1:A:330:ASN:HD22	1:A:333:LEU:HG	1.49	0.77
1:A:260:GLU:C	1:A:262:ALA:H	1.93	0.76
1:A:304:LYS:HE3	1:A:308:LEU:HD21	1.67	0.76
1:A:290:VAL:HG21	1:A:362:TYR:OH	1.85	0.76
1:A:315:THR:HG23	1:A:322:VAL:HG13	1.69	0.74
1:A:468:ILE:HD12	1:A:468:ILE:N	1.98	0.73
1:A:297:VAL:HG11	1:A:302:MET:HE2	1.70	0.73
1:A:422:LEU:O	1:A:426:LYS:HD3	1.89	0.73
1:A:35:MET:HG2	1:A:114:PHE:CE1	2.24	0.72
1:A:226:ARG:O	1:A:229:LYS:HG3	1.91	0.70
1:A:422:LEU:HB3	1:A:426:LYS:NZ	2.08	0.69
1:A:337:ILE:HG22	1:A:346:LEU:HD11	1.76	0.68
1:A:408:MET:O	1:A:410:THR:N	2.27	0.68
1:A:422:LEU:HB3	1:A:426:LYS:HZ3	1.60	0.67
1:A:84:LYS:HE2	3:A:1067:HOH:O	1.95	0.66
1:A:203:PHE:CD1	1:A:207:GLY:HA3	2.30	0.66
1:A:496:LEU:HD13	1:A:589:ARG:HA	1.78	0.66
1:A:389:MET:HE2	1:A:391:PHE:HE2	1.61	0.65
1:A:413:GLY:O	1:A:414:THR:HG23	1.95	0.65
1:A:299:LYS:HD2	1:A:300:GLU:H	1.62	0.65
1:A:36:ARG:HH22	1:A:536:ASP:CG	2.05	0.64
1:A:330:ASN:HD21	1:A:332:LYS:HB2	1.62	0.64
1:A:307:ASP:O	1:A:310:LYS:HG2	1.96	0.64
1:A:411:ARG:HD3	1:A:414:THR:OG1	1.99	0.63
1:A:131:LYS:HE2	1:A:508:GLN:HE22	1.65	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:460:ILE:O	1:A:464:GLN:HG3	1.98	0.62
1:A:132:GLU:HB2	3:A:1169:HOH:O	1.99	0.62
1:A:140:VAL:HG13	1:A:143:LYS:HB2	1.82	0.62
1:A:497:ARG:HG3	1:A:497:ARG:HH11	1.64	0.61
1:A:213:VAL:HG12	1:A:272:PHE:CE2	2.36	0.61
1:A:164:ARG:HG3	1:A:164:ARG:HH11	1.66	0.61
1:A:302:MET:HE1	1:A:350:ARG:HA	1.82	0.61
1:A:325:ASP:OD1	1:A:327:THR:HB	2.01	0.61
1:A:524:ALA:HB2	1:A:568:LEU:HD11	1.83	0.61
1:A:268:ARG:HA	1:A:271:GLU:HG2	1.82	0.61
1:A:23:LYS:O	1:A:24:ASP:HB2	2.00	0.60
1:A:264:LYS:O	1:A:268:ARG:HG3	2.02	0.60
1:A:384:GLU:OE2	1:A:387:LYS:HD3	2.02	0.60
1:A:458:VAL:HG22	1:A:478:MET:HE1	1.83	0.60
1:A:81:ALA:HB1	1:A:86:LEU:HD11	1.83	0.59
1:A:576:GLU:H	1:A:576:GLU:CD	2.11	0.59
1:A:341:SER:C	1:A:343:GLY:H	2.10	0.59
1:A:35:MET:HG2	1:A:114:PHE:CD1	2.37	0.59
1:A:330:ASN:ND2	1:A:332:LYS:HB2	2.17	0.59
1:A:418:LEU:HD23	3:A:970:HOH:O	2.01	0.58
1:A:539:ARG:HH22	1:A:543:LYS:HZ3	1.52	0.58
1:A:226:ARG:HG2	1:A:229:LYS:HZ1	1.68	0.58
1:A:173:ALA:O	1:A:177:GLU:HG3	2.03	0.58
1:A:405:VAL:HG22	1:A:471:TYR:CE2	2.39	0.58
1:A:458:VAL:CG2	1:A:478:MET:HE1	2.34	0.58
1:A:429:MET:O	1:A:433:MET:HB2	2.05	0.57
1:A:514:ALA:HB2	1:A:579:THR:HG22	1.86	0.57
1:A:426:LYS:HD2	1:A:475:TRP:HH2	1.70	0.57
1:A:252:PHE:O	1:A:254:ARG:HG2	2.04	0.57
1:A:422:LEU:HD22	1:A:426:LYS:NZ	2.20	0.57
1:A:36:ARG:HD3	3:A:1166:HOH:O	2.04	0.57
1:A:40:SER:HB3	1:A:51:SER:HB2	1.87	0.56
1:A:64:MET:HE1	1:A:530:LEU:HD22	1.87	0.56
1:A:260:GLU:C	1:A:262:ALA:N	2.63	0.56
1:A:322:VAL:C	1:A:323:LEU:HD12	2.31	0.56
1:A:337:ILE:CG2	1:A:346:LEU:HD11	2.35	0.56
1:A:430:HIS:ND1	1:A:479:LEU:HD22	2.22	0.55
1:A:405:VAL:HG22	1:A:471:TYR:CZ	2.41	0.55
1:A:149:PHE:HA	3:A:978:HOH:O	2.06	0.55
1:A:226:ARG:HG2	1:A:229:LYS:HZ2	1.70	0.55
1:A:410:THR:O	1:A:412:LYS:HD3	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:348:LEU:CD1	1:A:382:PHE:HB3	2.37	0.55
1:A:187:ASN:HB2	1:A:288:TYR:CD2	2.41	0.55
1:A:316:HIS:CG	1:A:316:HIS:O	2.60	0.54
1:A:415:VAL:HG22	1:A:416:VAL:N	2.21	0.54
1:A:377:LEU:O	1:A:381:GLN:HG3	2.07	0.54
1:A:115:ASN:HB3	1:A:118:PHE:HB3	1.88	0.54
1:A:126:ASP:OD1	1:A:130:ARG:HD3	2.07	0.54
1:A:417:PHE:CD1	1:A:418:LEU:N	2.75	0.54
1:A:10:GLN:HG2	1:A:122:LEU:HD23	1.89	0.54
1:A:324:ILE:CD1	1:A:338:VAL:HG11	2.38	0.54
1:A:187:ASN:HB2	1:A:288:TYR:CE2	2.43	0.54
1:A:304:LYS:O	1:A:304:LYS:HD3	2.08	0.53
1:A:159:HIS:HD2	1:A:161:GLY:N	2.06	0.53
1:A:251:TYR:HD1	1:A:251:TYR:O	1.90	0.53
1:A:415:VAL:HG22	1:A:416:VAL:O	2.08	0.53
1:A:253:LYS:HA	1:A:256:GLU:OE2	2.08	0.53
1:A:173:ALA:HB3	1:A:185:ARG:NH1	2.23	0.53
1:A:191:ASP:HA	1:A:196:PHE:CZ	2.44	0.53
1:A:258:GLY:O	1:A:260:GLU:HG3	2.08	0.53
1:A:58:LEU:HD23	1:A:71:ILE:HG13	1.91	0.53
1:A:410:THR:HG21	3:A:938:HOH:O	2.07	0.52
1:A:206:TYR:CD2	1:A:226:ARG:HD2	2.45	0.52
1:A:41:GLN:O	1:A:45:LYS:HG3	2.09	0.52
1:A:356:MET:HE3	1:A:391:PHE:HZ	1.74	0.52
1:A:497:ARG:HG3	1:A:497:ARG:NH1	2.24	0.52
1:A:502:ASN:C	1:A:502:ASN:HD22	2.17	0.52
1:A:124:ILE:HB	1:A:125:PRO:HD3	1.92	0.52
1:A:251:TYR:HE1	1:A:262:ALA:HA	1.74	0.52
1:A:284:LEU:HD21	1:A:423:GLU:OE2	2.09	0.52
1:A:149:PHE:HE2	1:A:286:ILE:HD13	1.75	0.52
1:A:304:LYS:O	1:A:308:LEU:HG	2.09	0.51
1:A:58:LEU:HD23	1:A:71:ILE:CG1	2.40	0.51
1:A:218:HIS:HE1	1:A:421:ILE:HD11	1.75	0.51
1:A:342:ASP:OD1	1:A:344:THR:HG22	2.11	0.51
1:A:318:ASP:OD1	1:A:319:LYS:HG3	2.11	0.51
1:A:163:LEU:CD2	1:A:408:MET:HE1	2.40	0.51
1:A:367:MET:HE2	1:A:397:LEU:CD2	2.40	0.51
1:A:367:MET:HE3	1:A:369:TYR:CE1	2.45	0.51
1:A:443:ILE:HD13	1:A:443:ILE:N	2.26	0.51
1:A:412:LYS:HE2	3:A:1120:HOH:O	2.09	0.51
1:A:476:GLU:HG2	1:A:477:ARG:H	1.74	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:413:GLY:O	1:A:414:THR:CG2	2.59	0.51
1:A:252:PHE:O	1:A:254:ARG:N	2.44	0.50
1:A:416:VAL:HB	1:A:422:LEU:HD21	1.94	0.50
1:A:32:VAL:HG12	1:A:36:ARG:NH2	2.26	0.50
1:A:89:GLN:O	1:A:92:GLU:HB3	2.11	0.50
1:A:55:PHE:HB3	1:A:56:PRO:CD	2.42	0.50
1:A:163:LEU:HD22	1:A:408:MET:HE1	1.93	0.49
1:A:258:GLY:O	1:A:259:ASP:C	2.54	0.49
1:A:55:PHE:HB3	1:A:56:PRO:HD3	1.94	0.49
1:A:422:LEU:O	1:A:425:THR:HG22	2.11	0.49
1:A:541:ALA:O	1:A:545:HIS:N	2.43	0.49
1:A:196:PHE:HB3	1:A:254:ARG:HH22	1.77	0.49
1:A:294:GLU:HB3	1:A:350:ARG:HD2	1.94	0.49
1:A:315:THR:CG2	1:A:322:VAL:HG13	2.40	0.49
1:A:296:GLN:HA	1:A:296:GLN:NE2	2.27	0.49
1:A:410:THR:O	1:A:411:ARG:C	2.55	0.49
1:A:297:VAL:CG1	1:A:302:MET:HE2	2.41	0.49
1:A:534:TYR:HB3	1:A:535:PRO:HD3	1.95	0.49
1:A:441:ALA:HB1	1:A:443:ILE:HD12	1.95	0.49
1:A:70:LEU:C	1:A:70:LEU:HD12	2.38	0.48
1:A:131:LYS:HE2	1:A:508:GLN:NE2	2.27	0.48
1:A:140:VAL:CG1	1:A:143:LYS:HB2	2.43	0.48
1:A:260:GLU:O	1:A:261:GLU:HB2	2.13	0.48
1:A:47:SER:HB3	1:A:90:TRP:CZ2	2.48	0.48
1:A:145:VAL:HA	1:A:366:LYS:O	2.14	0.48
1:A:356:MET:HE3	1:A:391:PHE:CZ	2.48	0.48
1:A:97:GLY:O	1:A:98:ASP:HB2	2.13	0.48
1:A:444:GLU:C	1:A:446:PRO:HD3	2.39	0.48
1:A:496:LEU:HD13	1:A:589:ARG:CA	2.42	0.48
1:A:297:VAL:HG11	1:A:302:MET:CE	2.40	0.48
1:A:159:HIS:HD2	1:A:161:GLY:H	1.62	0.47
1:A:173:ALA:CB	1:A:185:ARG:NH1	2.77	0.47
1:A:348:LEU:HA	1:A:378:HIS:HE1	1.79	0.47
1:A:417:PHE:HD1	1:A:418:LEU:N	2.02	0.47
1:A:341:SER:O	1:A:343:GLY:N	2.48	0.47
1:A:476:GLU:H	1:A:476:GLU:CD	2.22	0.47
1:A:159:HIS:CD2	1:A:161:GLY:H	2.33	0.47
1:A:82:ASN:HD22	1:A:82:ASN:C	2.21	0.47
1:A:557:LEU:O	1:A:561:VAL:HG23	2.15	0.47
1:A:502:ASN:C	1:A:502:ASN:ND2	2.73	0.46
1:A:265:ILE:HG23	1:A:266:TRP:N	2.29	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:315:THR:CG2	1:A:316:HIS:N	2.78	0.46
1:A:148:GLU:HA	1:A:186:MET:O	2.14	0.46
1:A:179:LEU:HD12	1:A:542:ILE:HD12	1.98	0.46
1:A:437:GLU:HB3	3:A:1042:HOH:O	2.15	0.46
1:A:426:LYS:HG2	1:A:458:VAL:HG21	1.97	0.46
1:A:151:SER:HA	1:A:187:ASN:OD1	2.16	0.46
1:A:72:PRO:HB2	1:A:75:ARG:HG2	1.98	0.46
1:A:425:THR:HG23	1:A:426:LYS:HD2	1.97	0.46
1:A:348:LEU:HA	1:A:378:HIS:CE1	2.50	0.46
1:A:340:LYS:HG3	1:A:344:THR:HG22	1.98	0.46
1:A:164:ARG:HD2	1:A:405:VAL:HG23	1.97	0.46
1:A:200:ALA:O	1:A:204:GLU:HG2	2.16	0.46
1:A:314:LEU:HB3	1:A:324:ILE:HG23	1.99	0.45
1:A:531:LEU:HD21	1:A:588:ALA:HA	1.98	0.45
1:A:238:ILE:O	1:A:238:ILE:HG23	2.15	0.45
1:A:587:ALA:O	1:A:591:VAL:HG23	2.16	0.45
1:A:250:GLU:OE2	1:A:253:LYS:HD3	2.16	0.45
1:A:257:ASP:HB2	1:A:260:GLU:OE2	2.16	0.45
1:A:401:ASN:O	1:A:467:ARG:NH1	2.50	0.45
1:A:413:GLY:C	1:A:414:THR:HG23	2.41	0.45
1:A:10:GLN:HG2	1:A:122:LEU:CD2	2.47	0.45
1:A:114:PHE:O	1:A:116:PRO:HD3	2.17	0.45
1:A:443:ILE:H	1:A:443:ILE:CD1	2.30	0.45
1:A:251:TYR:OH	1:A:265:ILE:HG21	2.17	0.44
1:A:427:GLU:OE1	1:A:451:ASP:HB2	2.18	0.44
1:A:348:LEU:HD11	1:A:382:PHE:HB3	1.98	0.44
1:A:208:ASN:HD22	1:A:211:ALA:HB2	1.83	0.44
1:A:423:GLU:HA	1:A:423:GLU:OE1	2.16	0.44
1:A:341:SER:C	1:A:343:GLY:N	2.74	0.44
1:A:63:THR:HB	3:A:1086:HOH:O	2.17	0.44
1:A:476:GLU:HG2	1:A:477:ARG:N	2.33	0.43
1:A:195:GLN:HG3	1:A:196:PHE:CD1	2.53	0.43
1:A:337:ILE:HG22	1:A:346:LEU:CD1	2.45	0.43
1:A:506:ILE:O	1:A:509:GLU:HB3	2.18	0.43
1:A:44:SER:O	1:A:47:SER:O	2.36	0.43
1:A:576:GLU:CD	1:A:576:GLU:N	2.77	0.43
1:A:149:PHE:N	1:A:149:PHE:CD1	2.86	0.43
1:A:527:LEU:HD23	1:A:584:LEU:HG	2.00	0.43
1:A:238:ILE:O	1:A:239:PRO:C	2.61	0.42
1:A:296:GLN:HA	1:A:296:GLN:HE21	1.83	0.42
1:A:348:LEU:HD12	1:A:382:PHE:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:322:VAL:HB	1:A:339:GLN:HB3	2.01	0.42
1:A:177:GLU:CD	1:A:185:ARG:HH21	2.27	0.42
1:A:218:HIS:CE1	1:A:418:LEU:HD13	2.53	0.42
1:A:260:GLU:O	1:A:262:ALA:N	2.49	0.42
1:A:138:LYS:C	1:A:140:VAL:H	2.28	0.42
1:A:175:LEU:HA	1:A:598:LEU:HD11	2.02	0.42
1:A:274:ILE:O	1:A:278:ILE:HG13	2.19	0.42
1:A:55:PHE:N	1:A:56:PRO:HD2	2.35	0.42
1:A:68:ASP:O	1:A:69:LEU:HD12	2.20	0.42
1:A:164:ARG:HH11	1:A:164:ARG:CG	2.32	0.42
1:A:256:GLU:H	1:A:256:GLU:CD	2.28	0.42
1:A:359:TYR:O	1:A:363:HIS:N	2.44	0.42
1:A:347:TYR:OH	2:A:900:ARG:HG2	2.20	0.41
1:A:415:VAL:CG2	1:A:416:VAL:N	2.82	0.41
1:A:218:HIS:CD2	1:A:418:LEU:HD13	2.56	0.41
1:A:153:ASN:HB2	1:A:156:LYS:HB2	2.02	0.41
1:A:198:LEU:CD1	1:A:231:ILE:HD11	2.51	0.41
1:A:299:LYS:HD2	1:A:299:LYS:N	2.34	0.41
1:A:390:GLY:O	1:A:391:PHE:C	2.63	0.41
1:A:530:LEU:HD12	1:A:530:LEU:HA	1.90	0.41
1:A:557:LEU:HD23	1:A:557:LEU:C	2.46	0.41
1:A:449:VAL:O	1:A:453:VAL:HG23	2.19	0.41
1:A:96:CYS:O	1:A:97:GLY:C	2.64	0.41
1:A:179:LEU:HD12	1:A:542:ILE:CD1	2.51	0.41
1:A:198:LEU:HD13	1:A:231:ILE:HD11	2.02	0.41
1:A:540:ASN:O	1:A:543:LYS:HB3	2.20	0.41
1:A:259:ASP:C	1:A:261:GLU:N	2.77	0.41
1:A:426:LYS:HG2	1:A:458:VAL:CG2	2.51	0.41
1:A:445:HIS:HB3	1:A:448:GLU:OE1	2.20	0.41
1:A:472:GLU:HG2	3:A:935:HOH:O	2.20	0.41
1:A:474:LYS:NZ	3:A:930:HOH:O	2.52	0.41
1:A:36:ARG:NH2	1:A:536:ASP:OD1	2.47	0.41
1:A:507:THR:C	1:A:509:GLU:N	2.79	0.41
1:A:267:LYS:O	1:A:271:GLU:HG2	2.21	0.40
1:A:172:LEU:HA	1:A:172:LEU:HD23	1.80	0.40
1:A:226:ARG:CG	1:A:229:LYS:HZ1	2.33	0.40
1:A:43:LEU:HD11	1:A:90:TRP:CE3	2.55	0.40
1:A:417:PHE:CD1	1:A:417:PHE:N	2.79	0.40
1:A:443:ILE:HD13	1:A:443:ILE:H	1.86	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	601/607 (99%)	545 (91%)	45 (8%)	11 (2%)	6	13

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	259	ASP
1	A	409	SER
1	A	97	GLY
1	A	236	ASP
1	A	240	LEU
1	A	342	ASP
1	A	253	LYS
1	A	502	ASN
1	A	239	PRO
1	A	414	THR
1	A	483	GLY

### 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	523/526 (99%)	505 (97%)	18 (3%)	32	57

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	ARG
1	A	53	LEU
1	A	69	LEU
1	A	98	ASP
1	A	140	VAL
1	A	214	LYS
1	A	229	LYS
1	A	299	LYS
1	A	374	GLN
1	A	388	GLN
1	A	417	PHE
1	A	418	LEU
1	A	431	GLU
1	A	433	MET
1	A	443	ILE
1	A	468	ILE
1	A	529	ARG
1	A	530	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	HIS
1	A	62	ASN
1	A	82	ASN
1	A	111	GLN
1	A	142	ASN
1	A	159	HIS
1	A	208	ASN
1	A	242	GLN
1	A	245	ASN
1	A	285	ASN
1	A	330	ASN
1	A	381	GLN
1	A	502	ASN
1	A	508	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

Mogul was not executed - this section is therefore empty.

## 5.5 Carbohydrates [i](#)

Mogul was not executed - this section is therefore empty.

## 5.6 Ligand geometry [i](#)

Mogul was not executed - this section is therefore empty.

## 5.7 Other polymers [i](#)

Mogul was not executed - this section is therefore empty.

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

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

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.