



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 05:19 AM UTC

PDB ID : 11AS / pdb_000011as
Title : ASPARAGINE SYNTHETASE MUTANT C51A, C315A COMPLEXED WITH L-ASPARAGINE
Authors : Nakatsu, T.; Kato, H.; Oda, J.
Deposited on : 1997-12-02
Resolution : 2.50 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 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:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	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

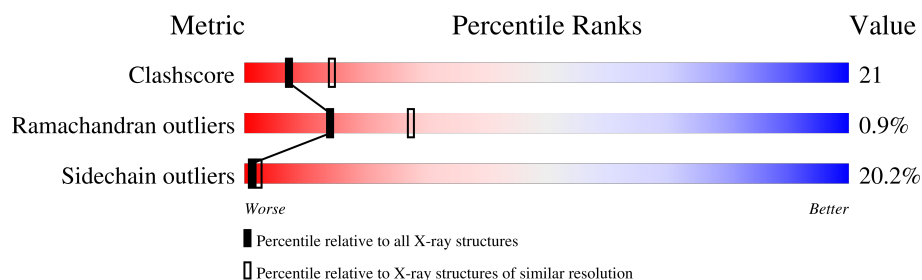
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	330	
1	B	330	

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 5220 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.

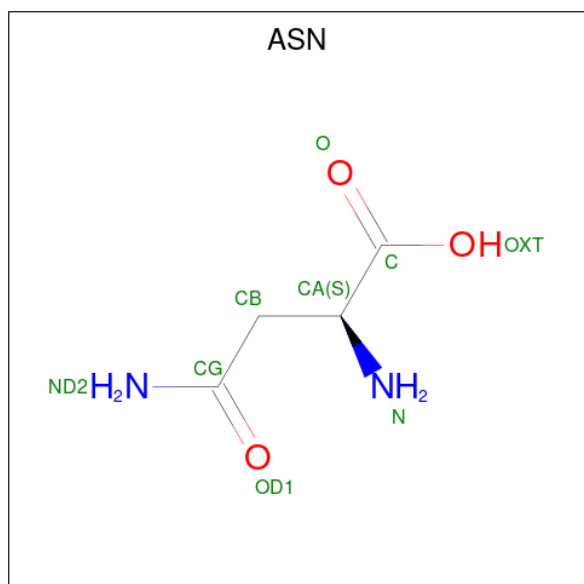
- Molecule 1 is a protein called ASPARAGINE SYNTHETASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	327	Total	C	N	O	S	0	0	0
			2559	1616	455	483	5			
1	B	327	Total	C	N	O	S	0	0	0
			2559	1616	455	483	5			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	51	ALA	CYS	engineered mutation	UNP P00963
A	315	ALA	CYS	engineered mutation	UNP P00963
B	51	ALA	CYS	engineered mutation	UNP P00963
B	315	ALA	CYS	engineered mutation	UNP P00963

- Molecule 2 is ASPARAGINE (CCD ID: ASN) (formula: $C_4H_8N_2O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			9	4	2	3		
2	B	1	Total	C	N	O	0	0
			9	4	2	3		

- Molecule 3 is water.

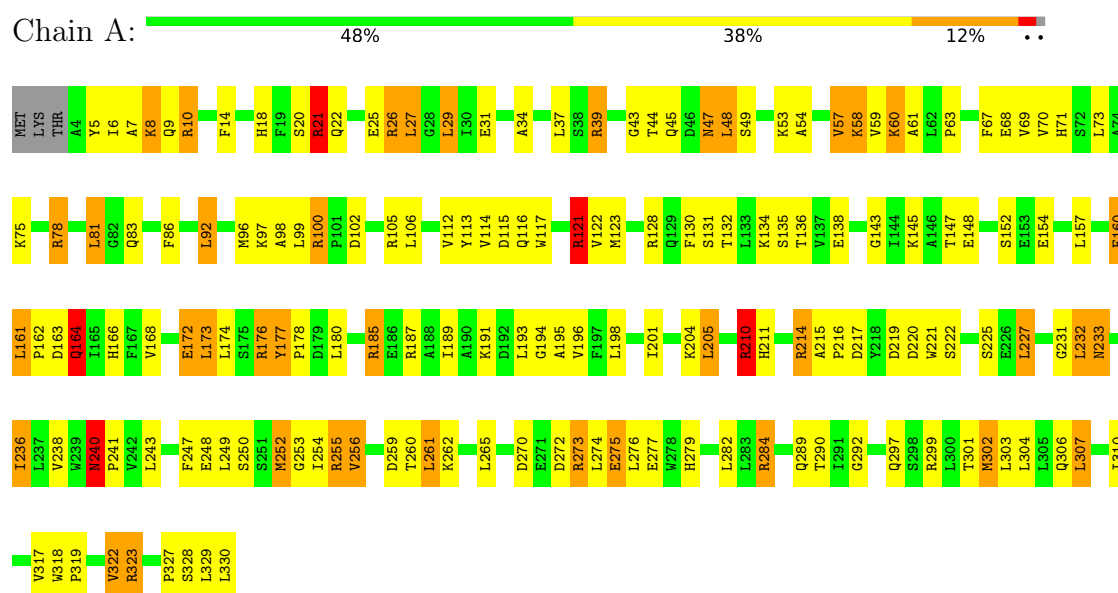
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	44	Total	O	0	0
			44	44		
3	B	40	Total	O	0	0
			40	40		

3 Residue-property plots

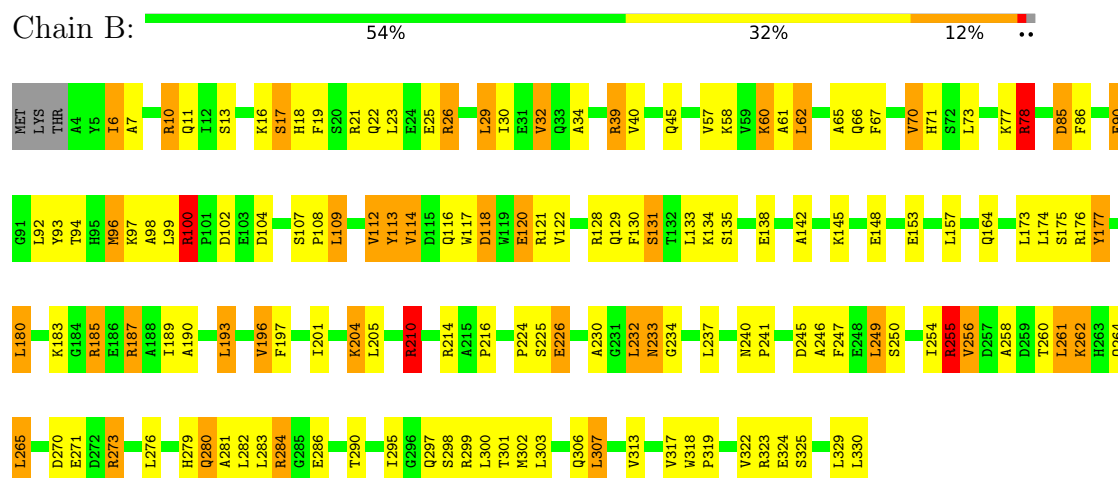
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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: ASPARAGINE SYNTHETASE



• Molecule 1: ASPARAGINE SYNTHETASE



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	52.90Å 126.20Å 52.78Å 90.00° 105.34° 90.00°	Depositor
Resolution (Å)	10.00 – 2.50	Depositor
% Data completeness (in resolution range)	72.2 (10.00-2.50)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.155 , 0.253	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5220	wwPDB-VP
Average B, all atoms (Å ²)	11.0	wwPDB-VP

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	0.54	0/2616	0.91	7/3545 (0.2%)
1	B	0.55	0/2616	0.96	4/3545 (0.1%)
All	All	0.55	0/5232	0.93	11/7090 (0.2%)

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	21
1	B	0	19
All	All	0	40

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	240	ASN	CA-C-N	6.61	126.38	119.05
1	A	240	ASN	C-N-CA	6.61	126.38	119.05
1	B	100	ARG	CA-C-N	6.33	126.53	119.32
1	B	100	ARG	C-N-CA	6.33	126.53	119.32
1	A	217	ASP	N-CA-C	5.90	119.79	112.59
1	A	161	LEU	CA-C-N	5.72	127.00	119.84
1	A	161	LEU	C-N-CA	5.72	127.00	119.84
1	B	307	LEU	CA-C-N	5.68	125.21	119.19
1	B	307	LEU	C-N-CA	5.68	125.21	119.19
1	A	307	LEU	CA-C-N	5.04	125.11	119.87
1	A	307	LEU	C-N-CA	5.04	125.11	119.87

There are no chirality outliers.

All (40) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	10	ARG	Sidechain
1	A	100	ARG	Sidechain
1	A	105	ARG	Sidechain
1	A	121	ARG	Sidechain
1	A	128	ARG	Sidechain
1	A	176	ARG	Sidechain
1	A	177	TYR	Sidechain
1	A	185	ARG	Sidechain
1	A	21	ARG	Sidechain
1	A	210	ARG	Sidechain
1	A	214	ARG	Sidechain
1	A	255	ARG	Sidechain
1	A	26	ARG	Sidechain
1	A	273	ARG	Sidechain
1	A	284	ARG	Sidechain
1	A	299	ARG	Sidechain
1	A	323	ARG	Sidechain
1	A	39	ARG	Sidechain
1	A	69	VAL	Mainchain,Peptide
1	A	78	ARG	Sidechain
1	B	10	ARG	Sidechain
1	B	100	ARG	Sidechain
1	B	113	TYR	Sidechain
1	B	121	ARG	Sidechain
1	B	128	ARG	Sidechain
1	B	176	ARG	Sidechain
1	B	177	TYR	Sidechain
1	B	185	ARG	Sidechain
1	B	187	ARG	Sidechain
1	B	21	ARG	Sidechain
1	B	210	ARG	Sidechain
1	B	214	ARG	Sidechain
1	B	255	ARG	Sidechain
1	B	26	ARG	Sidechain
1	B	273	ARG	Sidechain
1	B	284	ARG	Sidechain
1	B	323	ARG	Sidechain
1	B	39	ARG	Sidechain
1	B	78	ARG	Sidechain

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	2559	0	2518	110	0
1	B	2559	0	2518	106	0
2	A	9	0	5	0	0
2	B	9	0	5	0	0
3	A	44	0	0	3	0
3	B	40	0	0	2	0
All	All	5220	0	5046	209	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 21.

All (209) 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:130:PHE:HB3	1:B:226:GLU:HG3	1.46	0.98
1:A:60:LYS:HG3	1:B:102:ASP:HA	1.49	0.94
1:A:273:ARG:HA	1:A:276:LEU:HD13	1.53	0.90
1:A:43:GLY:HA2	1:A:276:LEU:HD23	1.55	0.86
1:A:236:ILE:HG13	1:A:250:SER:HB3	1.63	0.80
1:B:224:PRO:HA	1:B:230:ALA:HA	1.64	0.78
1:A:57:VAL:HG22	1:A:67:PHE:HB2	1.63	0.78
1:A:177:TYR:HB2	1:A:185:ARG:HG2	1.66	0.78
1:A:272:ASP:O	1:A:275:GLU:HG2	1.83	0.77
1:B:273:ARG:HA	1:B:276:LEU:HD23	1.69	0.75
1:A:232:LEU:HG	1:A:254:ILE:HD12	1.70	0.73
1:A:329:LEU:O	1:A:330:LEU:HB2	1.88	0.73
1:A:255:ARG:HD3	1:A:292:GLY:H	1.53	0.72
1:B:98:ALA:HB3	1:B:114:VAL:HG22	1.71	0.71
1:A:210:ARG:H	1:A:210:ARG:HE	1.38	0.71
1:B:45:GLN:HE22	1:B:71:HIS:H	1.36	0.71
1:A:134:LYS:O	1:A:138:GLU:HG3	1.92	0.69
1:A:115:ASP:HB2	1:A:297:GLN:HE21	1.56	0.69
1:B:73:LEU:O	1:B:77:LYS:HG3	1.94	0.68
1:A:22:GLN:NE2	1:A:26:ARG:HD2	2.09	0.68
1:A:6:ILE:O	1:A:10:ARG:HG2	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:177:TYR:HB3	1:B:180:LEU:HD11	1.76	0.67
1:B:210:ARG:HE	1:B:210:ARG:N	1.94	0.66
1:B:329:LEU:O	1:B:330:LEU:HB2	1.94	0.66
1:B:109:LEU:HD21	1:B:247:PHE:CD1	2.30	0.66
1:A:145:LYS:HE2	1:A:163:ASP:HA	1.78	0.66
1:A:240:ASN:HB3	1:A:243:LEU:HB2	1.78	0.65
1:B:61:ALA:O	1:B:62:LEU:HD23	1.96	0.65
1:B:196:VAL:HG12	3:B:366:HOH:O	1.97	0.64
1:A:78:ARG:NH2	1:A:282:LEU:HD11	2.11	0.64
1:B:216:PRO:HB2	1:B:265:LEU:HD12	1.78	0.64
1:B:96:MET:SD	1:B:98:ALA:HB2	2.37	0.64
1:A:185:ARG:O	1:A:189:ILE:HG22	1.99	0.63
1:B:173:LEU:HD21	1:B:189:ILE:HD13	1.80	0.63
1:A:210:ARG:H	1:A:210:ARG:NE	1.97	0.62
1:A:117:TRP:CZ3	1:A:297:GLN:HA	2.35	0.61
1:A:78:ARG:HD2	1:A:290:THR:OG1	2.00	0.61
1:A:232:LEU:HB3	1:A:254:ILE:HB	1.83	0.61
1:B:45:GLN:NE2	1:B:71:HIS:H	1.99	0.60
1:A:21:ARG:O	1:A:25:GLU:HG2	2.02	0.59
1:A:152:SER:HA	1:A:157:LEU:O	2.02	0.59
1:A:162:PRO:HG2	1:A:195:ALA:HB2	1.84	0.59
1:A:14:PHE:CZ	1:A:154:GLU:HG3	2.36	0.59
1:A:7:ALA:HA	3:A:347:HOH:O	2.02	0.59
1:A:34:ALA:HB1	1:A:73:LEU:HD11	1.84	0.59
1:B:307:LEU:HD12	1:B:313:VAL:HG13	1.85	0.58
1:A:61:ALA:O	1:A:63:PRO:HD3	2.04	0.58
1:B:261:LEU:HD22	1:B:265:LEU:HD13	1.86	0.58
1:B:97:LYS:HG2	1:B:113:TYR:HE1	1.69	0.57
1:B:39:ARG:HD2	1:B:67:PHE:CE2	2.38	0.57
1:B:265:LEU:HG	1:B:270:ASP:O	2.04	0.57
1:A:100:ARG:HD2	1:A:114:VAL:HG21	1.87	0.56
1:B:34:ALA:HB1	1:B:73:LEU:HD11	1.87	0.56
1:A:81:LEU:HB3	1:A:86:PHE:HB2	1.88	0.56
1:A:60:LYS:NZ	1:B:104:ASP:HA	2.21	0.55
1:B:45:GLN:HE22	1:B:70:VAL:HA	1.71	0.55
1:B:117:TRP:CZ3	1:B:300:LEU:HD23	2.42	0.55
1:B:232:LEU:HG	1:B:254:ILE:HD12	1.88	0.55
1:A:22:GLN:HE21	1:A:26:ARG:HD2	1.72	0.55
1:A:270:ASP:HB3	1:A:273:ARG:HD2	1.88	0.55
1:B:204:LYS:HE3	1:B:204:LYS:H	1.72	0.55
1:B:73:LEU:O	1:B:77:LYS:HE2	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:27:LEU:O	1:A:29:LEU:HD13	2.06	0.54
1:A:176:ARG:O	1:A:178:PRO:HD3	2.07	0.54
1:B:16:LYS:HE2	1:B:297:GLN:HB3	1.87	0.54
1:A:60:LYS:HZ1	1:B:104:ASP:HA	1.72	0.54
1:A:168:VAL:HG21	1:A:189:ILE:HD11	1.90	0.54
1:B:210:ARG:HE	1:B:210:ARG:H	1.54	0.54
1:A:115:ASP:HB2	1:A:297:GLN:NE2	2.22	0.54
1:B:26:ARG:HH12	1:B:142:ALA:C	2.16	0.53
1:B:319:PRO:HD2	1:B:322:VAL:HG11	1.88	0.53
1:B:18:HIS:O	1:B:22:GLN:HG2	2.08	0.53
1:B:196:VAL:HG23	1:B:237:LEU:O	2.08	0.53
1:A:174:LEU:O	1:A:178:PRO:HA	2.07	0.53
1:A:148:GLU:OE1	1:A:161:LEU:HD12	2.09	0.53
1:A:238:VAL:HG23	1:A:247:PHE:HB3	1.90	0.52
1:A:177:TYR:HB3	1:A:180:LEU:HD13	1.91	0.52
1:B:120:GLU:OE2	1:B:255:ARG:HD2	2.09	0.52
1:B:301:THR:HG22	1:B:313:VAL:HG11	1.92	0.52
1:B:233:ASN:H	1:B:233:ASN:HD22	1.57	0.52
1:B:273:ARG:HA	1:B:276:LEU:CD2	2.39	0.52
1:B:71:HIS:O	1:B:100:ARG:NH2	2.43	0.52
1:B:157:LEU:HB3	1:B:306:GLN:HE22	1.74	0.52
1:B:129:GLN:HG3	1:B:131:SER:OG	2.10	0.52
1:A:164:GLN:HG2	3:A:361:HOH:O	2.09	0.52
1:A:220:ASP:OD2	1:A:260:THR:HG21	2.10	0.52
1:A:160:PHE:HD2	1:A:241:PRO:HG2	1.74	0.52
1:B:39:ARG:HH21	1:B:65:ALA:HB2	1.74	0.51
1:B:40:VAL:HG21	1:B:66:GLN:HG3	1.92	0.51
1:A:261:LEU:HD12	1:A:282:LEU:HD23	1.93	0.51
1:A:172:GLU:O	1:A:176:ARG:HG3	2.10	0.51
1:B:260:THR:O	1:B:264:GLN:HG3	2.11	0.51
1:B:61:ALA:C	1:B:62:LEU:HD23	2.36	0.51
1:A:216:PRO:HD2	1:A:273:ARG:HH22	1.77	0.50
1:A:160:PHE:CD2	1:A:241:PRO:HG2	2.47	0.50
1:B:173:LEU:HB3	1:B:185:ARG:HB3	1.93	0.50
1:B:307:LEU:HD12	1:B:313:VAL:CG1	2.41	0.50
1:B:117:TRP:CZ3	1:B:297:GLN:HA	2.47	0.50
1:A:106:LEU:HB3	1:A:318:TRP:HZ3	1.76	0.50
1:A:255:ARG:HD3	1:A:292:GLY:N	2.23	0.50
1:B:187:ARG:HA	1:B:246:ALA:HB2	1.94	0.49
1:B:86:PHE:HB3	1:B:90:GLU:HB3	1.93	0.49
1:A:67:PHE:CE1	1:B:317:VAL:HG11	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:78:ARG:HH21	1:A:282:LEU:CD1	2.26	0.49
1:A:225:SER:C	1:A:227:LEU:H	2.21	0.49
1:B:96:MET:HB2	1:B:118:ASP:HB2	1.95	0.49
1:B:130:PHE:HB2	1:B:225:SER:HB2	1.94	0.48
1:B:201:ILE:H	1:B:233:ASN:HD21	1.61	0.48
1:B:204:LYS:HE3	1:B:204:LYS:N	2.28	0.48
1:B:284:ARG:HD2	1:B:286:GLU:OE2	2.14	0.48
1:A:22:GLN:HE21	1:A:143:GLY:HA2	1.78	0.48
1:A:327:PRO:O	1:A:328:SER:HB2	2.13	0.48
1:A:78:ARG:HH21	1:A:282:LEU:HD11	1.76	0.48
1:A:97:LYS:HD2	1:A:113:TYR:OH	2.14	0.48
1:B:177:TYR:HB3	1:B:180:LEU:CD1	2.44	0.48
1:A:47:ASN:HD21	1:A:75:LYS:NZ	2.12	0.48
1:A:177:TYR:HB3	1:A:180:LEU:HD22	1.96	0.48
1:B:78:ARG:HG3	1:B:290:THR:OG1	2.13	0.48
1:B:318:TRP:HB3	1:B:322:VAL:HG13	1.95	0.48
1:A:136:THR:HG22	1:A:252:MET:HE1	1.96	0.48
1:A:273:ARG:HB3	1:A:279:HIS:CE1	2.49	0.48
1:A:18:HIS:CD2	1:A:21:ARG:NH1	2.82	0.47
1:B:232:LEU:HB3	1:B:254:ILE:HB	1.95	0.47
1:B:134:LYS:O	1:B:138:GLU:HG3	2.13	0.47
1:B:197:PHE:CZ	1:B:234:GLY:HA3	2.49	0.47
1:A:6:ILE:HG23	1:B:30:ILE:HD13	1.96	0.47
1:A:59:VAL:HG13	1:B:112:VAL:HG11	1.96	0.47
1:B:318:TRP:HB3	1:B:322:VAL:CG1	2.44	0.47
1:B:29:LEU:HB3	1:B:93:TYR:HD1	1.79	0.47
1:B:109:LEU:HD21	1:B:247:PHE:CE1	2.49	0.47
1:A:174:LEU:HD22	1:A:205:LEU:HB3	1.96	0.47
1:B:7:ALA:O	1:B:11:GLN:HG3	2.15	0.46
1:B:40:VAL:CG2	1:B:66:GLN:HG3	2.44	0.46
1:A:8:LYS:HB3	1:A:8:LYS:HE2	1.53	0.46
1:A:25:GLU:OE2	1:A:26:ARG:HG3	2.16	0.46
1:A:262:LYS:HB2	1:A:262:LYS:NZ	2.31	0.46
1:A:302:MET:HE3	1:A:307:LEU:O	2.15	0.46
1:A:37:LEU:HA	1:A:68:GLU:O	2.16	0.46
1:A:233:ASN:HA	1:A:253:GLY:HA2	1.98	0.46
1:A:96:MET:HE3	1:A:116:GLN:HB2	1.97	0.45
1:A:121:ARG:NH2	1:A:122:VAL:O	2.49	0.45
1:A:243:LEU:HD21	1:A:302:MET:HE2	1.98	0.45
1:A:162:PRO:HG3	1:A:194:GLY:C	2.41	0.45
1:A:259:ASP:HA	1:A:262:LYS:HZ2	1.82	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:86:PHE:HD2	1:B:90:GLU:HB3	1.81	0.45
1:B:261:LEU:HG	1:B:282:LEU:HD23	1.98	0.45
1:B:258:ALA:O	1:B:262:LYS:HG3	2.16	0.45
1:A:319:PRO:O	1:A:322:VAL:HG13	2.17	0.45
1:A:5:TYR:O	1:A:9:GLN:HG2	2.17	0.44
1:A:47:ASN:H	1:A:47:ASN:ND2	2.16	0.44
1:A:189:ILE:HG13	1:A:196:VAL:HG11	1.98	0.44
1:B:276:LEU:HB2	1:B:279:HIS:HD2	1.82	0.44
1:A:22:GLN:O	1:A:26:ARG:HB2	2.17	0.44
1:B:13:SER:O	1:B:17:SER:HB2	2.17	0.44
1:B:40:VAL:HG21	1:B:66:GLN:CG	2.47	0.44
1:B:98:ALA:HB3	1:B:114:VAL:CG2	2.45	0.44
1:B:281:ALA:O	1:B:286:GLU:HB2	2.17	0.44
1:A:123:MET:HE1	1:A:254:ILE:HG12	2.00	0.43
1:B:133:LEU:HD22	1:B:232:LEU:O	2.17	0.43
1:B:281:ALA:HA	1:B:284:ARG:HB2	1.98	0.43
1:A:48:LEU:O	1:A:215:ALA:HB2	2.18	0.43
1:B:116:GLN:HA	1:B:295:ILE:O	2.18	0.43
1:A:81:LEU:HA	1:A:86:PHE:CD1	2.53	0.43
1:A:54:ALA:HB2	1:A:71:HIS:CE1	2.53	0.43
1:A:330:LEU:HD11	3:A:369:HOH:O	2.18	0.43
1:A:18:HIS:CD2	1:A:147:THR:HA	2.54	0.43
1:A:96:MET:SD	1:A:98:ALA:HB2	2.59	0.43
1:A:233:ASN:ND2	1:A:233:ASN:C	2.77	0.43
1:A:58:LYS:HZ3	1:A:59:VAL:H	1.67	0.43
1:A:198:LEU:HD21	1:A:211:HIS:CE1	2.54	0.43
1:B:240:ASN:HA	1:B:241:PRO:HD2	1.92	0.43
1:A:201:ILE:O	1:A:214:ARG:HD2	2.19	0.43
1:B:175:SER:HB2	3:B:354:HOH:O	2.18	0.43
1:B:249:LEU:HD12	1:B:249:LEU:HA	1.83	0.43
1:A:275:GLU:HG2	1:A:275:GLU:H	1.60	0.42
1:B:19:PHE:O	1:B:22:GLN:HB2	2.19	0.42
1:B:210:ARG:H	1:B:210:ARG:NE	2.17	0.42
1:A:236:ILE:CG1	1:A:250:SER:HB3	2.41	0.42
1:B:319:PRO:HD2	1:B:322:VAL:CG1	2.48	0.42
1:A:112:VAL:HG11	1:A:317:VAL:HG22	2.01	0.42
1:A:102:ASP:HA	1:B:60:LYS:HD3	2.01	0.42
1:A:221:TRP:HA	1:A:231:GLY:HA2	2.01	0.42
1:A:148:GLU:OE1	1:A:161:LEU:HB2	2.20	0.42
1:B:6:ILE:H	1:B:6:ILE:HG13	1.52	0.42
1:B:45:GLN:HE22	1:B:71:HIS:N	2.10	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:123:MET:HB2	1:A:289:GLN:O	2.19	0.42
1:B:107:SER:HB2	1:B:108:PRO:HD2	2.02	0.42
1:B:256:VAL:HG22	1:B:260:THR:HB	2.02	0.42
1:B:189:ILE:HG13	1:B:193:LEU:HD22	2.01	0.42
1:A:60:LYS:HE2	1:A:60:LYS:HB3	1.71	0.41
1:A:130:PHE:CZ	1:A:134:LYS:HB2	2.55	0.41
1:B:190:ALA:HB2	1:B:237:LEU:CD1	2.50	0.41
1:B:96:MET:HE3	1:B:96:MET:HB3	1.89	0.41
1:B:34:ALA:HB1	1:B:73:LEU:CD1	2.48	0.41
1:A:106:LEU:HB3	1:A:318:TRP:CZ3	2.55	0.41
1:B:233:ASN:HD22	1:B:233:ASN:N	2.17	0.41
1:B:298:SER:O	1:B:302:MET:HB2	2.21	0.41
1:A:166:HIS:ND1	1:A:193:LEU:HB3	2.36	0.41
1:B:34:ALA:HB2	1:B:94:THR:HB	2.02	0.41
1:B:122:VAL:HA	1:B:290:THR:HG22	2.01	0.41
1:B:189:ILE:HG12	1:B:196:VAL:HG11	2.03	0.41
1:B:280:GLN:O	1:B:283:LEU:HB2	2.20	0.41
1:A:173:LEU:HD21	1:A:189:ILE:HB	2.02	0.41
1:A:205:LEU:HD12	1:A:205:LEU:HA	1.89	0.40
1:B:109:LEU:HD23	1:B:299:ARG:HE	1.86	0.40
1:A:92:LEU:C	1:A:92:LEU:HD23	2.46	0.40
1:A:177:TYR:O	1:A:185:ARG:HD3	2.22	0.40
1:B:16:LYS:CE	1:B:297:GLN:HB3	2.51	0.40
1:B:32:VAL:HG12	1:B:94:THR:HG22	2.04	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	325/330 (98%)	284 (87%)	37 (11%)	4 (1%)	10 20

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	325/330 (98%)	299 (92%)	24 (7%)	2 (1%)	21	38
All	All	650/660 (98%)	583 (90%)	61 (9%)	6 (1%)	14	27

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	70	VAL
1	B	131	SER
1	A	160	PHE
1	B	85	ASP
1	A	164	GLN
1	A	256	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	269/272 (99%)	212 (79%)	57 (21%)	1	2
1	B	269/272 (99%)	217 (81%)	52 (19%)	1	2
All	All	538/544 (99%)	429 (80%)	109 (20%)	1	2

All (109) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	LYS
1	A	20	SER
1	A	21	ARG
1	A	27	LEU
1	A	29	LEU
1	A	31	GLU
1	A	39	ARG
1	A	44	THR
1	A	45	GLN
1	A	47	ASN

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Mol	Chain	Res	Type
1	A	48	LEU
1	A	49	SER
1	A	53	LYS
1	A	57	VAL
1	A	58	LYS
1	A	60	LYS
1	A	81	LEU
1	A	83	GLN
1	A	92	LEU
1	A	99	LEU
1	A	121	ARG
1	A	131	SER
1	A	132	THR
1	A	135	SER
1	A	164	GLN
1	A	172	GLU
1	A	173	LEU
1	A	187	ARG
1	A	191	LYS
1	A	204	LYS
1	A	205	LEU
1	A	210	ARG
1	A	219	ASP
1	A	222	SER
1	A	227	LEU
1	A	232	LEU
1	A	233	ASN
1	A	236	ILE
1	A	240	ASN
1	A	248	GLU
1	A	249	LEU
1	A	252	MET
1	A	256	VAL
1	A	261	LEU
1	A	265	LEU
1	A	274	LEU
1	A	275	GLU
1	A	277	GLU
1	A	284	ARG
1	A	301	THR
1	A	302	MET
1	A	303	LEU

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Mol	Chain	Res	Type
1	A	304	LEU
1	A	306	GLN
1	A	310	ILE
1	A	322	VAL
1	A	323	ARG
1	B	6	ILE
1	B	10	ARG
1	B	17	SER
1	B	23	LEU
1	B	25	GLU
1	B	29	LEU
1	B	32	VAL
1	B	57	VAL
1	B	58	LYS
1	B	60	LYS
1	B	62	LEU
1	B	70	VAL
1	B	78	ARG
1	B	85	ASP
1	B	90	GLU
1	B	92	LEU
1	B	96	MET
1	B	99	LEU
1	B	109	LEU
1	B	112	VAL
1	B	114	VAL
1	B	118	ASP
1	B	120	GLU
1	B	135	SER
1	B	145	LYS
1	B	148	GLU
1	B	153	GLU
1	B	164	GLN
1	B	174	LEU
1	B	180	LEU
1	B	183	LYS
1	B	193	LEU
1	B	196	VAL
1	B	204	LYS
1	B	205	LEU
1	B	210	ARG
1	B	226	GLU

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Mol	Chain	Res	Type
1	B	232	LEU
1	B	233	ASN
1	B	245	ASP
1	B	249	LEU
1	B	250	SER
1	B	255	ARG
1	B	256	VAL
1	B	261	LEU
1	B	262	LYS
1	B	265	LEU
1	B	271	GLU
1	B	280	GLN
1	B	303	LEU
1	B	324	GLU
1	B	325	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	HIS
1	A	45	GLN
1	A	47	ASN
1	A	79	GLN
1	A	95	HIS
1	A	110	HIS
1	A	209	HIS
1	A	240	ASN
1	A	279	HIS
1	A	289	GLN
1	A	297	GLN
1	B	11	GLN
1	B	22	GLN
1	B	45	GLN
1	B	47	ASN
1	B	56	GLN
1	B	66	GLN
1	B	84	HIS
1	B	95	HIS
1	B	110	HIS
1	B	116	GLN
1	B	129	GLN
1	B	164	GLN

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Mol	Chain	Res	Type
1	B	211	HIS
1	B	233	ASN
1	B	240	ASN
1	B	263	HIS
1	B	279	HIS
1	B	297	GLN
1	B	306	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

2 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	ASN	B	331	-	7,8,8	0.82	0	6,10,10	0.22	0
2	ASN	A	331	-	7,8,8	0.83	0	6,10,10	0.34	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ASN	B	331	-	-	6/8/8/8	-
2	ASN	A	331	-	-	5/8/8/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	331	ASN	C-CA-CB-CG
2	B	331	ASN	C-CA-CB-CG
2	B	331	ASN	CA-CB-CG-OD1
2	B	331	ASN	CA-CB-CG-ND2
2	B	331	ASN	N-CA-CB-CG
2	A	331	ASN	CA-CB-CG-OD1
2	A	331	ASN	CA-CB-CG-ND2
2	A	331	ASN	OXT-C-CA-CB
2	B	331	ASN	OXT-C-CA-CB
2	A	331	ASN	O-C-CA-CB
2	B	331	ASN	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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.