



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 2, 2026 – 01:51 AM UTC

PDB ID : 1PGU / pdb_00001pgu
Title : YEAST ACTIN INTERACTING PROTEIN 1 (AIP1), Se-Met PROTEIN,
MONOCLINIC CRYSTAL FORM
Authors : Voegtli, W.C.; Madrona, A.Y.; Wilson, D.K.
Deposited on : 2003-05-28
Resolution : 2.30 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

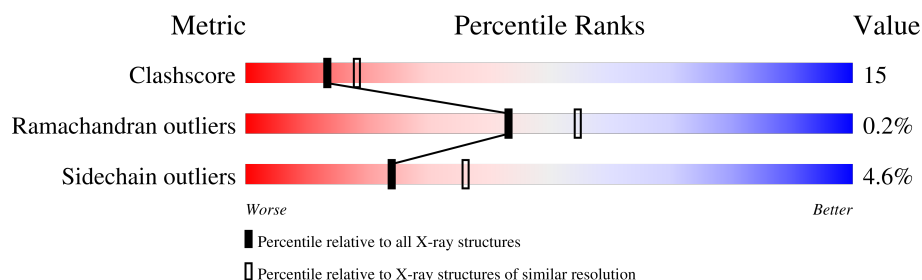
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)

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	615	 72% 24% . .
1	B	615	 70% 26% . .

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 9844 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 Actin interacting protein 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	606	Total	C	N	O	S	Se	0	0	0
			4675	2944	794	923	8	6			
1	B	608	Total	C	N	O	S	Se	0	0	0
			4693	2955	796	928	8	6			

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	174	MSE	MET	modified residue	UNP P46680
A	177	MSE	MET	modified residue	UNP P46680
A	360	MSE	MET	modified residue	UNP P46680
A	367	MSE	MET	modified residue	UNP P46680
A	509	MSE	MET	modified residue	UNP P46680
A	530	ARG	HIS	engineered mutation	UNP P46680
A	574	MSE	MET	modified residue	UNP P46680
B	174	MSE	MET	modified residue	UNP P46680
B	177	MSE	MET	modified residue	UNP P46680
B	360	MSE	MET	modified residue	UNP P46680
B	367	MSE	MET	modified residue	UNP P46680
B	509	MSE	MET	modified residue	UNP P46680
B	530	ARG	HIS	engineered mutation	UNP P46680
B	574	MSE	MET	modified residue	UNP P46680

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		
2	B	1	Total	Zn	0	0
			1	1		

- Molecule 3 is water.

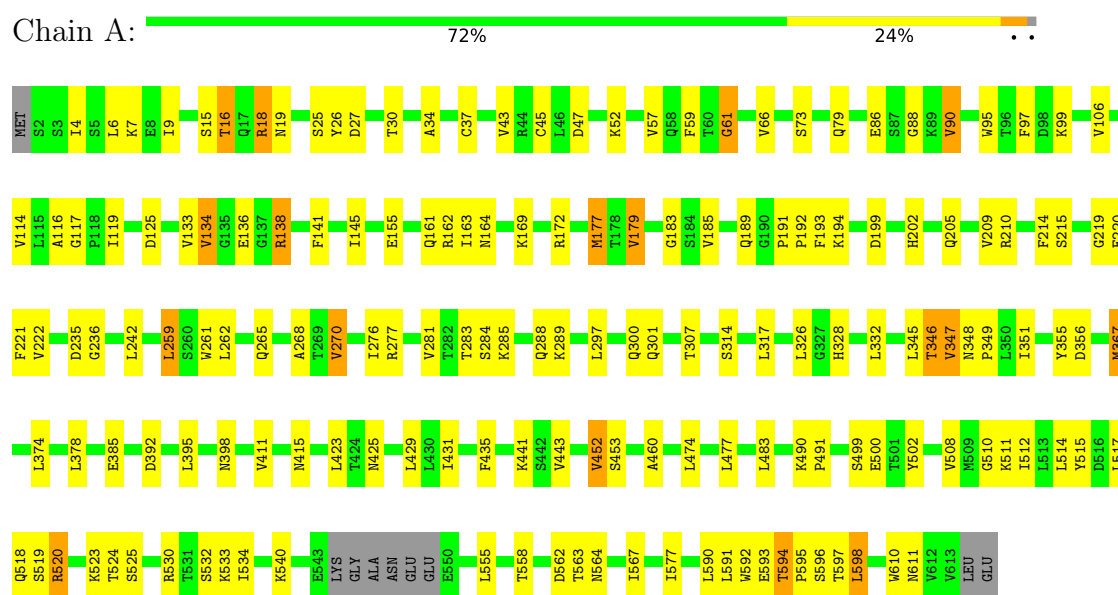
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	237	Total 237	O 237	0	0
3	B	237	Total 237	O 237	0	0

3 Residue-property plots

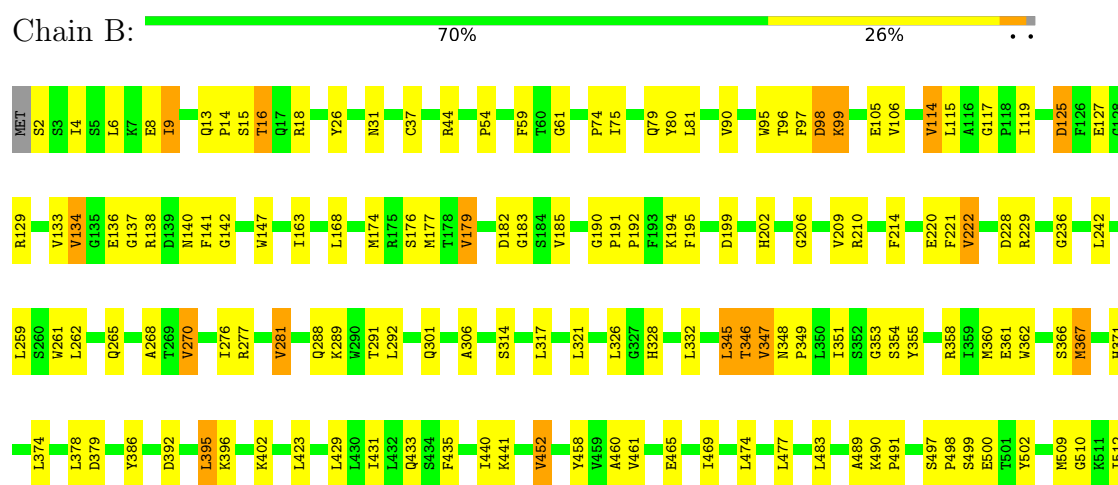
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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

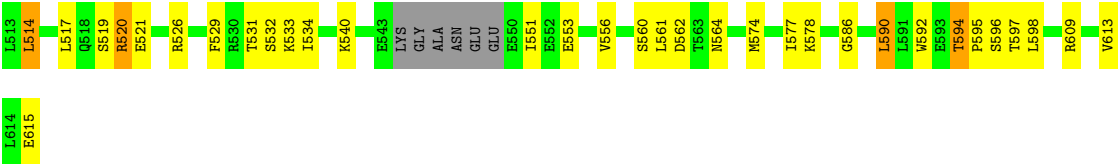
Note EDS was not executed.

• Molecule 1: Actin interacting protein 1



• Molecule 1: Actin interacting protein 1





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	60.80Å 154.53Å 69.00Å 90.00° 90.65° 90.00°	Depositor
Resolution (Å)	24.56 – 2.30	Depositor
% Data completeness (in resolution range)	97.7 (24.56-2.30)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.202 , 0.257	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	9844	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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	0.37	0/4768	0.92	13/6457 (0.2%)
1	B	0.37	0/4786	0.93	11/6480 (0.2%)
All	All	0.37	0/9554	0.92	24/12937 (0.2%)

There are no bond length outliers.

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	210	ARG	N-CA-C	7.57	121.00	111.69
1	B	281	VAL	N-CA-C	7.26	118.03	110.62
1	B	125	ASP	N-CA-C	-6.24	101.54	110.59
1	B	392	ASP	N-CA-C	-6.03	105.78	113.02
1	A	125	ASP	N-CA-C	-5.94	101.97	110.59
1	A	435	PHE	N-CA-C	5.93	120.22	112.92
1	B	586	GLY	N-CA-C	5.87	124.19	111.04
1	A	210	ARG	N-CA-C	5.86	120.49	113.23
1	A	564	ASN	N-CA-C	5.77	119.06	110.52
1	B	114	VAL	N-CA-C	5.75	115.97	110.74
1	A	356	ASP	N-CA-C	-5.72	105.96	113.17
1	B	435	PHE	N-CA-C	5.68	119.91	112.92
1	A	169	LYS	N-CA-C	-5.66	101.66	110.10
1	A	145	ILE	N-CA-C	5.51	116.64	108.65
1	A	392	ASP	N-CA-C	-5.51	106.60	113.15
1	B	395	LEU	N-CA-C	-5.41	100.08	108.90
1	A	116	ALA	N-CA-C	-5.34	105.37	111.14
1	A	262	LEU	N-CA-C	-5.33	105.13	111.69
1	A	525	SER	N-CA-C	-5.25	105.58	112.41
1	B	458	TYR	N-CA-C	5.21	117.60	109.52
1	B	564	ASN	N-CA-C	5.18	118.46	110.42
1	B	578	LYS	N-CA-C	5.17	117.53	109.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	61	GLY	N-CA-C	5.02	120.42	113.99
1	A	73	SER	N-CA-C	-5.02	102.91	110.24

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	4675	0	4573	125	0
1	B	4693	0	4592	147	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	237	0	0	4	0
3	B	237	0	0	4	0
All	All	9844	0	9165	272	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 15.

All (272) 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:345:LEU:HD12	1:A:591:LEU:HD12	1.41	0.99
1:B:594:THR:HG22	1:B:596:SER:H	1.35	0.89
1:B:423:LEU:HD11	1:B:452:VAL:HG13	1.54	0.88
1:A:594:THR:HG22	1:A:596:SER:H	1.43	0.82
1:A:508:VAL:HG12	1:A:533:LYS:HD2	1.62	0.82
1:B:114:VAL:HG12	1:B:115:LEU:HG	1.59	0.82
1:B:519:SER:O	1:B:520:ARG:HG2	1.80	0.81
1:B:138:ARG:HA	1:B:138:ARG:NE	1.96	0.81
1:B:6:LEU:HD21	1:B:9:ILE:HD11	1.64	0.79
1:B:594:THR:HB	1:B:597:THR:OG1	1.84	0.78
1:B:16:THR:CG2	1:B:317:LEU:HD12	2.13	0.77
1:A:179:VAL:HG13	1:A:209:VAL:HB	1.66	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:16:THR:CG2	1:A:317:LEU:HD12	2.14	0.77
1:A:52:LYS:HA	1:A:99:LYS:HD2	1.66	0.76
1:A:514:LEU:HD12	1:A:523:LYS:HB3	1.68	0.76
1:B:16:THR:HG21	1:B:317:LEU:O	1.86	0.75
1:B:199:ASP:OD2	1:B:202:HIS:HD2	1.70	0.75
1:A:30:THR:HG21	3:A:796:HOH:O	1.85	0.75
1:A:6:LEU:HD21	1:A:9:ILE:HD11	1.68	0.75
1:A:346:THR:HG22	1:A:351:ILE:H	1.52	0.74
1:A:52:LYS:HD3	1:A:99:LYS:HD2	1.69	0.74
1:A:4:ILE:HG13	1:A:577:ILE:HG22	1.71	0.70
1:B:54:PRO:HG3	1:B:97:PHE:CD2	2.25	0.70
1:A:15:SER:HB2	1:A:37:CYS:HA	1.72	0.70
1:A:555:LEU:HD12	1:A:567:ILE:HG22	1.74	0.70
1:A:261:TRP:HH2	1:A:281:VAL:HG11	1.57	0.69
1:A:114:VAL:HG21	1:A:133:VAL:HG11	1.73	0.69
1:A:16:THR:HG21	1:A:317:LEU:O	1.94	0.68
1:B:261:TRP:HH2	1:B:281:VAL:HG11	1.58	0.68
1:B:440:ILE:HG22	1:B:441:LYS:HD2	1.76	0.68
1:A:431:ILE:HB	1:A:441:LYS:HG2	1.76	0.67
1:B:75:ILE:HD11	1:B:127:GLU:O	1.95	0.66
1:A:346:THR:HG22	1:A:351:ILE:N	2.10	0.66
1:A:270:VAL:HG23	1:A:276:ILE:HG13	1.77	0.66
1:B:13:GLN:OE1	1:B:321:LEU:HD23	1.95	0.66
1:A:594:THR:HG23	1:A:595:PRO:HD2	1.77	0.66
1:B:594:THR:HG23	1:B:595:PRO:HD2	1.78	0.65
1:B:265:GLN:O	1:B:281:VAL:HG22	1.97	0.65
1:B:2:SER:HA	1:B:613:VAL:O	1.97	0.64
1:B:16:THR:HG21	1:B:317:LEU:HD12	1.78	0.64
1:A:355:TYR:HA	1:A:374:LEU:HA	1.79	0.64
1:B:44:ARG:HD3	3:B:730:HOH:O	1.97	0.64
1:B:452:VAL:HG12	1:B:461:VAL:HG22	1.80	0.64
1:B:117:GLY:H	1:B:137:GLY:HA2	1.62	0.64
1:B:519:SER:C	1:B:520:ARG:HG2	2.23	0.64
1:B:222:VAL:CG2	1:B:236:GLY:HA2	2.28	0.64
1:A:52:LYS:HD3	1:A:99:LYS:CD	2.28	0.63
1:B:540:LYS:HB2	1:B:592:TRP:CZ2	2.34	0.63
1:A:199:ASP:OD2	1:A:202:HIS:HD2	1.81	0.63
1:A:540:LYS:HE3	1:A:595:PRO:O	1.97	0.63
1:B:328:HIS:HD1	1:B:332:LEU:HD21	1.61	0.63
1:A:259:LEU:HA	1:A:268:ALA:O	1.98	0.63
1:A:594:THR:HB	1:A:597:THR:OG1	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:79:GLN:HG2	1:A:95:TRP:CZ2	2.34	0.63
1:B:54:PRO:HG3	1:B:97:PHE:CG	2.35	0.61
1:A:183:GLY:HA2	1:A:209:VAL:HG23	1.82	0.61
1:B:9:ILE:HD12	1:B:9:ILE:N	2.14	0.61
1:A:222:VAL:CG2	1:A:236:GLY:HA2	2.31	0.61
1:A:97:PHE:CE2	1:A:99:LYS:HG2	2.37	0.60
1:A:179:VAL:HG22	1:A:185:VAL:HG22	1.84	0.60
1:B:261:TRP:CH2	1:B:281:VAL:HG11	2.36	0.60
1:A:345:LEU:CD1	1:A:591:LEU:HD12	2.26	0.60
1:A:590:LEU:HD22	1:A:598:LEU:HD22	1.83	0.60
1:B:590:LEU:CD2	1:B:598:LEU:HD22	2.31	0.60
1:A:345:LEU:HD13	1:A:346:THR:N	2.16	0.60
1:A:502:TYR:CE2	1:A:523:LYS:HD2	2.37	0.60
1:B:6:LEU:CD2	1:B:9:ILE:HD11	2.30	0.59
1:A:328:HIS:HD2	1:A:332:LEU:HD21	1.65	0.59
1:A:270:VAL:HG22	1:A:301:GLN:CB	2.33	0.59
1:A:395:LEU:C	1:A:395:LEU:HD23	2.28	0.59
1:B:517:LEU:C	1:B:517:LEU:HD23	2.28	0.59
1:A:562:ASP:C	1:A:563:THR:HG23	2.28	0.58
1:A:517:LEU:C	1:A:517:LEU:HD23	2.28	0.58
1:B:395:LEU:HD23	1:B:395:LEU:C	2.29	0.58
1:B:556:VAL:HG23	1:B:556:VAL:O	2.03	0.58
1:B:355:TYR:HA	1:B:374:LEU:HA	1.86	0.58
1:B:367:MSE:O	1:B:367:MSE:HG3	2.03	0.58
1:A:261:TRP:CH2	1:A:281:VAL:HG11	2.38	0.57
1:B:179:VAL:HG22	1:B:185:VAL:HG22	1.87	0.57
1:B:590:LEU:HD22	1:B:598:LEU:HD22	1.86	0.57
1:A:222:VAL:HG23	1:A:236:GLY:HA2	1.85	0.57
1:A:16:THR:HG21	1:A:317:LEU:HD12	1.86	0.57
1:A:90:VAL:HG23	1:A:119:ILE:HD13	1.85	0.57
1:A:27:ASP:OD1	1:A:30:THR:HG22	2.05	0.56
1:B:138:ARG:HA	1:B:138:ARG:HE	1.71	0.56
1:B:270:VAL:HG13	1:B:301:GLN:CB	2.36	0.56
1:A:18:ARG:HE	1:A:297:LEU:HD11	1.70	0.56
1:A:519:SER:O	1:A:520:ARG:HG2	2.06	0.56
1:A:214:PHE:CD2	1:A:222:VAL:HG22	2.41	0.56
1:A:27:ASP:HB3	1:A:30:THR:HG22	1.88	0.55
1:B:129:ARG:HA	1:B:147:TRP:CD1	2.41	0.55
1:B:345:LEU:HD23	1:B:346:THR:H	1.70	0.55
1:B:174:MSE:HB2	1:B:190:GLY:O	2.06	0.55
1:A:177:MSE:HG3	1:A:222:VAL:HG11	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:194:LYS:HD2	1:B:195:PHE:H	1.72	0.55
1:B:540:LYS:HE3	1:B:595:PRO:O	2.06	0.55
1:A:288:GLN:HG3	1:A:289:LYS:N	2.20	0.55
1:A:270:VAL:CG2	1:A:276:ILE:HG13	2.37	0.54
1:B:360:MSE:HG2	1:B:362:TRP:CZ2	2.41	0.54
1:B:532:SER:OG	1:B:561:LEU:HB3	2.08	0.54
1:A:45:CYS:SG	1:A:47:ASP:HB2	2.48	0.54
1:B:551:ILE:HD12	1:B:551:ILE:N	2.23	0.54
1:A:346:THR:HG23	1:A:349:PRO:O	2.08	0.54
1:A:499:SER:O	1:A:500:GLU:HB2	2.08	0.54
1:B:347:VAL:HG13	1:B:348:ASN:ND2	2.22	0.54
1:A:423:LEU:CD1	1:A:452:VAL:HG22	2.37	0.54
1:A:502:TYR:HE2	1:A:523:LYS:HD2	1.73	0.54
1:B:140:ASN:ND2	1:B:142:GLY:H	2.06	0.54
1:A:283:THR:O	1:A:284:SER:HB3	2.08	0.53
1:B:16:THR:HG23	1:B:317:LEU:HD12	1.87	0.53
1:B:551:ILE:HD12	1:B:551:ILE:H	1.74	0.53
1:A:59:PHE:CZ	1:A:61:GLY:HA3	2.44	0.53
1:B:8:GLU:C	1:B:9:ILE:HD12	2.34	0.53
1:B:95:TRP:HA	1:B:105:GLU:O	2.09	0.53
1:A:6:LEU:HD21	1:A:9:ILE:CD1	2.39	0.52
1:B:469:ILE:HB	1:B:483:LEU:HD12	1.91	0.52
1:A:7:LYS:HD2	1:A:611:ASN:OD1	2.10	0.52
1:B:592:TRP:CE2	1:B:598:LEU:HD21	2.44	0.52
1:B:228:ASP:C	1:B:229:ARG:HG2	2.35	0.52
1:A:415:ASN:HB2	3:A:710:HOH:O	2.09	0.52
1:B:259:LEU:HA	1:B:268:ALA:O	2.09	0.52
1:B:26:TYR:OH	1:B:31:ASN:ND2	2.43	0.52
1:B:59:PHE:HD1	1:B:106:VAL:HG11	1.75	0.52
1:B:361:GLU:HB2	1:B:366:SER:HB2	1.91	0.52
1:B:80:TYR:C	1:B:81:LEU:HD12	2.35	0.51
1:B:134:VAL:HG11	1:B:163:ILE:HG22	1.92	0.51
1:B:214:PHE:CD2	1:B:222:VAL:HG22	2.45	0.51
1:B:262:LEU:HD23	1:B:306:ALA:HB2	1.92	0.51
1:B:533:LYS:O	1:B:560:SER:HB2	2.10	0.51
1:A:385:GLU:HG2	1:A:398:ASN:HD21	1.76	0.51
1:A:594:THR:HG23	1:A:595:PRO:CD	2.40	0.51
1:A:276:ILE:HD12	1:A:276:ILE:N	2.24	0.51
1:B:90:VAL:CG2	1:B:119:ILE:HD13	2.42	0.50
1:B:138:ARG:NE	1:B:138:ARG:CA	2.72	0.50
1:A:162:ARG:HD3	1:A:164:ASN:OD1	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:483:LEU:HD13	1:A:515:TYR:CG	2.46	0.50
1:B:433:GLN:HG3	1:B:440:ILE:HD11	1.93	0.50
1:A:540:LYS:HB2	1:A:592:TRP:CZ2	2.47	0.49
1:B:140:ASN:HD22	1:B:141:PHE:N	2.10	0.49
1:A:453:SER:HB3	1:A:460:ALA:HB3	1.94	0.49
1:A:519:SER:C	1:A:520:ARG:HG2	2.37	0.49
1:B:59:PHE:CZ	1:B:61:GLY:HA3	2.48	0.48
1:A:59:PHE:HD1	1:A:106:VAL:HG11	1.77	0.48
1:B:560:SER:OG	1:B:562:ASP:OD1	2.31	0.48
1:A:270:VAL:HG21	1:A:314:SER:OG	2.14	0.48
1:B:14:PRO:CD	1:B:321:LEU:HD21	2.44	0.48
1:B:194:LYS:HD2	1:B:195:PHE:N	2.29	0.48
1:B:423:LEU:CD1	1:B:452:VAL:HG13	2.34	0.48
1:B:474:LEU:HD13	1:B:474:LEU:O	2.13	0.48
1:A:367:MSE:O	1:A:367:MSE:HG3	2.13	0.48
1:A:43:VAL:HB	1:A:57:VAL:HB	1.96	0.48
1:B:222:VAL:HG23	1:B:236:GLY:HA2	1.96	0.48
1:B:594:THR:HG23	1:B:595:PRO:CD	2.44	0.48
1:A:347:VAL:HG11	1:A:593:GLU:HA	1.95	0.47
1:A:512:ILE:HD11	1:A:534:ILE:HG12	1.95	0.47
1:A:514:LEU:HB3	1:A:524:THR:HG22	1.96	0.47
1:A:66:VAL:HB	1:A:86:GLU:CD	2.39	0.47
1:A:510:GLY:HA2	1:A:532:SER:O	2.14	0.47
1:A:346:THR:CG2	1:A:351:ILE:HB	2.44	0.47
1:B:96:THR:HG21	1:B:99:LYS:NZ	2.29	0.47
1:B:498:PRO:HG2	1:B:553:GLU:OE1	2.14	0.47
1:A:183:GLY:HA2	1:A:209:VAL:CG2	2.45	0.47
1:B:270:VAL:HG13	1:B:301:GLN:HB3	1.95	0.47
1:A:411:VAL:HG23	1:A:452:VAL:CG2	2.44	0.47
1:B:291:THR:C	1:B:292:LEU:HD12	2.39	0.47
1:B:431:ILE:HD13	1:B:474:LEU:HD22	1.97	0.47
1:A:214:PHE:CE2	1:A:222:VAL:HG22	2.50	0.47
1:B:510:GLY:C	1:B:534:ILE:HD11	2.39	0.47
1:A:297:LEU:HD12	1:A:300:GLN:NE2	2.29	0.47
1:B:136:GLU:HG3	1:B:136:GLU:O	2.14	0.47
1:A:134:VAL:HG21	1:A:163:ILE:HG21	1.97	0.46
1:A:514:LEU:HD13	1:A:514:LEU:C	2.40	0.46
1:B:220:GLU:HG3	1:B:221:PHE:CD2	2.50	0.46
1:B:374:LEU:HD23	1:B:374:LEU:C	2.40	0.46
1:B:499:SER:O	1:B:500:GLU:HB2	2.15	0.46
1:A:59:PHE:CD1	1:A:106:VAL:HG11	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:179:VAL:HG11	1:A:209:VAL:HG12	1.98	0.46
1:B:168:LEU:HD23	1:B:176:SER:HB2	1.98	0.46
1:B:288:GLN:HG3	1:B:289:LYS:N	2.30	0.46
1:A:590:LEU:HD22	1:A:598:LEU:CD2	2.44	0.46
1:B:500:GLU:O	1:B:517:LEU:HD13	2.15	0.46
1:B:140:ASN:HD22	1:B:140:ASN:C	2.23	0.46
1:B:534:ILE:N	1:B:534:ILE:HD12	2.31	0.46
1:B:15:SER:HB3	1:B:37:CYS:HA	1.96	0.46
1:B:396:LYS:HE3	3:B:617:HOH:O	2.15	0.46
1:B:431:ILE:HB	1:B:441:LYS:HG2	1.98	0.46
1:B:433:GLN:HE21	1:B:440:ILE:HD11	1.80	0.46
1:A:345:LEU:HD12	1:A:591:LEU:CD1	2.28	0.46
1:B:182:ASP:HA	1:B:206:GLY:H	1.81	0.46
1:B:431:ILE:HD11	1:B:477:LEU:HD21	1.97	0.46
1:A:270:VAL:HG22	1:A:301:GLN:HB2	1.97	0.45
1:A:443:VAL:HG12	1:A:477:LEU:HD13	1.98	0.45
1:B:360:MSE:HG2	1:B:362:TRP:CE2	2.51	0.45
1:A:16:THR:HG23	1:A:317:LEU:HD12	1.94	0.45
1:A:90:VAL:HG23	1:A:119:ILE:CD1	2.47	0.45
1:B:402:LYS:HE3	3:B:827:HOH:O	2.17	0.45
1:A:220:GLU:HG3	1:A:221:PHE:CD2	2.52	0.45
1:B:345:LEU:HD23	1:B:346:THR:N	2.31	0.45
1:A:88:GLY:HA2	1:A:119:ILE:HG13	1.98	0.45
1:A:530:ARG:NH2	1:A:558:THR:OG1	2.50	0.45
1:B:183:GLY:HA2	1:B:209:VAL:HG23	1.99	0.45
1:A:4:ILE:HG13	1:A:577:ILE:CG2	2.43	0.45
1:B:379:ASP:O	1:B:386:TYR:HA	2.17	0.44
1:B:90:VAL:HG21	1:B:133:VAL:HG11	1.99	0.44
1:B:497:SER:OG	1:B:498:PRO:HD2	2.18	0.44
1:A:18:ARG:O	1:A:19:ASN:HB2	2.18	0.44
1:A:26:TYR:CD1	1:A:307:THR:HG22	2.52	0.44
1:A:235:ASP:HB2	1:A:242:LEU:HD11	1.98	0.44
1:A:283:THR:HB	1:A:285:LYS:HE3	1.99	0.44
1:B:371:HIS:CE1	1:B:396:LYS:HD2	2.53	0.44
1:B:517:LEU:HD23	1:B:517:LEU:O	2.17	0.44
1:A:191:PRO:HA	1:A:192:PRO:C	2.42	0.44
1:A:534:ILE:N	1:A:534:ILE:HD12	2.33	0.44
1:A:328:HIS:CD2	1:A:332:LEU:HD21	2.49	0.44
1:B:531:THR:HG22	1:B:531:THR:O	2.18	0.44
1:B:301:GLN:NE2	1:B:314:SER:OG	2.40	0.44
1:B:556:VAL:O	1:B:556:VAL:CG2	2.65	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:8:GLU:OE2	1:B:609:ARG:HD2	2.17	0.43
1:B:134:VAL:HG21	1:B:163:ILE:HG21	2.00	0.43
1:B:90:VAL:HG23	1:B:119:ILE:CD1	2.48	0.43
1:B:613:VAL:HG12	1:B:615:GLU:H	1.82	0.43
1:B:228:ASP:O	1:B:229:ARG:HG2	2.18	0.43
1:B:346:THR:HG23	1:B:349:PRO:O	2.18	0.43
1:A:179:VAL:HG13	1:A:209:VAL:CB	2.40	0.43
1:B:191:PRO:HA	1:B:192:PRO:C	2.43	0.43
1:B:6:LEU:CG	1:B:9:ILE:HD11	2.48	0.43
1:B:540:LYS:HD2	1:B:592:TRP:CH2	2.54	0.43
1:B:90:VAL:HG22	1:B:119:ILE:HD13	2.01	0.43
1:B:510:GLY:HA2	1:B:532:SER:O	2.18	0.43
1:A:345:LEU:HD13	1:A:346:THR:O	2.19	0.43
1:A:502:TYR:CD2	1:A:514:LEU:HD11	2.54	0.43
1:B:489:ALA:CB	1:B:509:MSE:HG2	2.49	0.42
1:A:215:SER:O	1:A:219:GLY:HA2	2.19	0.42
1:B:79:GLN:HG2	1:B:95:TRP:CZ2	2.54	0.42
1:B:529:PHE:CE2	1:B:531:THR:HA	2.54	0.42
1:B:540:LYS:HB2	1:B:592:TRP:CE2	2.53	0.42
1:A:268:ALA:HA	1:A:277:ARG:O	2.18	0.42
1:A:138:ARG:HE	1:A:138:ARG:C	2.27	0.42
1:A:205:GLN:O	1:A:205:GLN:HG3	2.20	0.42
1:B:353:GLY:HA2	1:B:358:ARG:O	2.20	0.42
1:B:490:LYS:HA	1:B:491:PRO:HD3	1.96	0.42
1:B:502:TYR:HB3	1:B:514:LEU:HD21	2.02	0.42
1:B:526:ARG:HG2	3:B:804:HOH:O	2.20	0.42
1:A:141:PHE:HB3	1:A:163:ILE:HG13	2.01	0.42
1:A:117:GLY:HA3	1:A:136:GLU:O	2.20	0.42
1:B:140:ASN:ND2	1:B:140:ASN:C	2.78	0.41
1:B:452:VAL:HA	1:B:460:ALA:O	2.20	0.41
1:B:532:SER:HB3	1:B:562:ASP:HB3	2.03	0.41
1:A:189:GLN:O	1:A:193:PHE:HA	2.20	0.41
1:B:4:ILE:HG13	1:B:577:ILE:HG22	2.02	0.41
1:B:346:THR:HG22	1:B:351:ILE:H	1.85	0.41
1:B:129:ARG:O	1:B:147:TRP:HD1	2.03	0.41
1:B:276:ILE:O	1:B:289:LYS:HA	2.20	0.41
1:B:512:ILE:CG1	1:B:534:ILE:HG12	2.51	0.41
1:A:265:GLN:O	1:A:281:VAL:HG22	2.20	0.41
1:A:423:LEU:HG	1:A:452:VAL:CG2	2.51	0.41
1:A:597:THR:HA	1:A:610:TRP:O	2.21	0.41
1:B:74:PRO:HG2	1:B:125:ASP:O	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:134:VAL:HG22	1:B:163:ILE:HD12	2.03	0.41
1:B:183:GLY:HA2	1:B:209:VAL:CG2	2.51	0.41
1:A:490:LYS:HA	1:A:491:PRO:HD3	1.95	0.41
1:B:179:VAL:HG22	1:B:209:VAL:HG11	2.02	0.41
1:B:268:ALA:HA	1:B:277:ARG:O	2.21	0.41
1:A:347:VAL:HG13	1:A:348:ASN:ND2	2.35	0.40
1:A:25:SER:HB3	1:A:34:ALA:HB3	2.03	0.40
1:A:518:GLN:HB2	3:A:677:HOH:O	2.21	0.40
1:B:138:ARG:C	1:B:140:ASN:N	2.76	0.40
1:B:179:VAL:HG13	1:B:209:VAL:HB	2.03	0.40
1:B:433:GLN:HG3	1:B:440:ILE:CD1	2.51	0.40
1:A:155:GLU:HG3	1:A:194:LYS:HZ1	1.86	0.40
1:B:59:PHE:CD1	1:B:106:VAL:HG11	2.54	0.40
1:A:285:LYS:HD2	3:A:811:HOH:O	2.22	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	602/615 (98%)	574 (95%)	28 (5%)	0	100	100
1	B	604/615 (98%)	576 (95%)	25 (4%)	3 (0%)	24	31
All	All	1206/1230 (98%)	1150 (95%)	53 (4%)	3 (0%)	43	55

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	98	ASP
1	B	99	LYS
1	B	465	GLU

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	528/529 (100%)	504 (96%)	24 (4%)	24	37
1	B	530/529 (100%)	505 (95%)	25 (5%)	23	35
All	All	1058/1058 (100%)	1009 (95%)	49 (5%)	24	36

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	THR
1	A	18	ARG
1	A	90	VAL
1	A	134	VAL
1	A	138	ARG
1	A	161	GLN
1	A	172	ARG
1	A	177	MSE
1	A	179	VAL
1	A	259	LEU
1	A	270	VAL
1	A	326	LEU
1	A	346	THR
1	A	347	VAL
1	A	367	MSE
1	A	378	LEU
1	A	425	ASN
1	A	429	LEU
1	A	452	VAL
1	A	474	LEU
1	A	511	LYS
1	A	520	ARG
1	A	594	THR
1	A	598	LEU
1	B	9	ILE
1	B	16	THR
1	B	18	ARG

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Mol	Chain	Res	Type
1	B	98	ASP
1	B	134	VAL
1	B	177	MSE
1	B	179	VAL
1	B	222	VAL
1	B	242	LEU
1	B	270	VAL
1	B	326	LEU
1	B	345	LEU
1	B	346	THR
1	B	347	VAL
1	B	354	SER
1	B	367	MSE
1	B	378	LEU
1	B	429	LEU
1	B	452	VAL
1	B	514	LEU
1	B	520	ARG
1	B	521	GLU
1	B	574	MSE
1	B	590	LEU
1	B	594	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	13	GLN
1	A	19	ASN
1	A	140	ASN
1	A	161	GLN
1	A	189	GLN
1	A	202	HIS
1	A	296	GLN
1	A	300	GLN
1	A	301	GLN
1	A	328	HIS
1	A	348	ASN
1	A	446	ASN
1	A	456	GLN
1	A	457	ASN
1	A	589	ASN
1	B	31	ASN

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Mol	Chain	Res	Type
1	B	79	GLN
1	B	102	ASN
1	B	140	ASN
1	B	189	GLN
1	B	202	HIS
1	B	265	GLN
1	B	295	GLN
1	B	301	GLN
1	B	456	GLN
1	B	457	ASN
1	B	589	ASN

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 ⓘ

Of 2 ligands modelled in this entry, 2 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

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.