



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 27, 2024 – 03:28 PM EDT

PDB ID : 1SVO  
Title : Structure of SV40 large T antigen helicase domain  
Authors : Gai, D.; Zhao, R.; Finkielstein, C.V.; Chen, X.S.  
Deposited on : 2004-03-29  
Resolution : 2.60 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 : 4.02b-467  
Xtriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

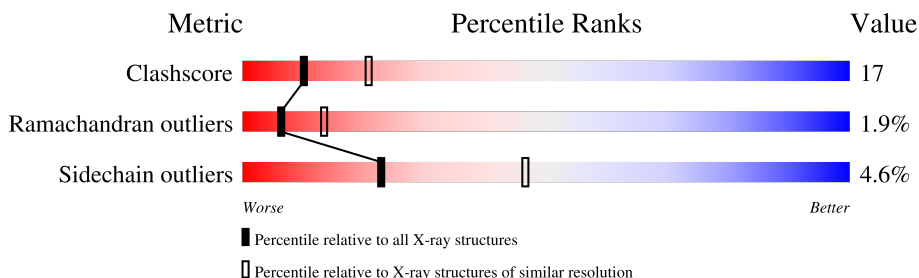
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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	180529	4181 (2.60-2.60)
Ramachandran outliers	177936	4129 (2.60-2.60)
Sidechain outliers	177891	4129 (2.60-2.60)

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	377	 62% 31% . .
1	B	377	 58% 34% . .

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6056 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 large T antigen.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	362	Total	C	N	O	S	0	0	0
			2933	1888	493	531	21			
1	B	362	Total	C	N	O	S	0	0	0
			2933	1888	493	531	21			

- Molecule 2 is ZINC ION (three-letter code: 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.

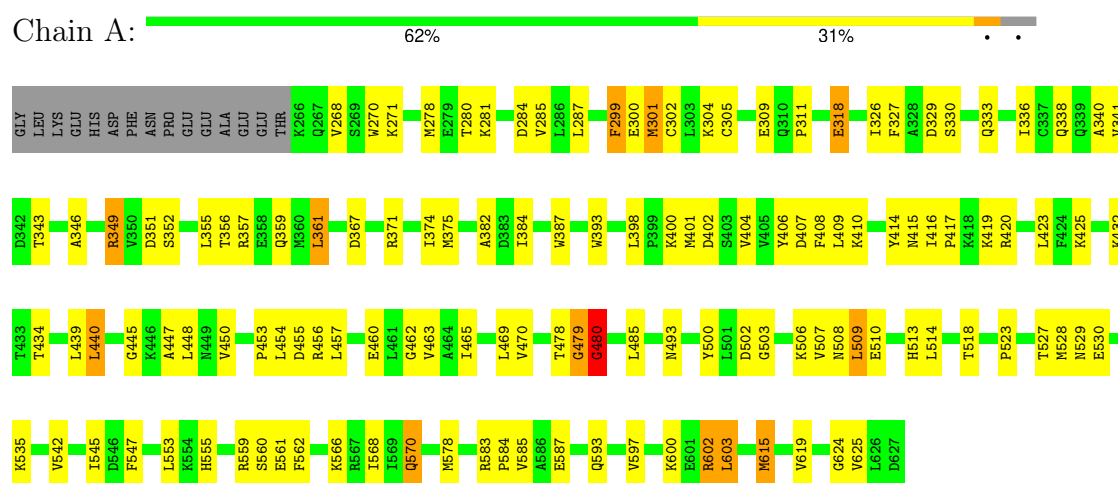
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	103	Total	O	0	0
			103	103		
3	B	85	Total	O	0	0
			85	85		

### 3 Residue-property plots

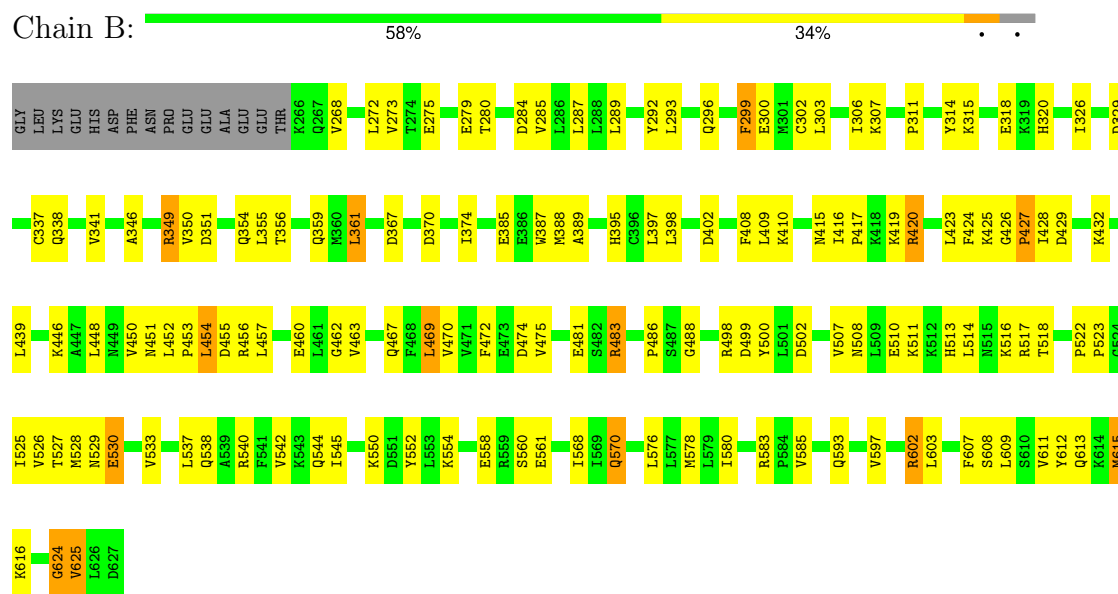
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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



- Molecule 1: large T antigen



## 4 Data and refinement statistics

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

Property	Value	Source
Space group	P 3 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	120.44Å 120.44Å 131.77Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 2.60	Depositor
% Data completeness (in resolution range)	90.5 (30.00-2.60)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	CNS	Depositor
R, $R_{free}$	0.233 , 0.271	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	6056	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	48.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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	0.51	1/2992 (0.0%)	0.66	1/4030 (0.0%)
1	B	0.50	1/2992 (0.0%)	0.67	0/4030
All	All	0.50	2/5984 (0.0%)	0.67	1/8060 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	615	MET	SD-CE	-5.18	1.48	1.77
1	A	615	MET	SD-CE	-5.10	1.49	1.77

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	480	GLY	N-CA-C	6.14	128.45	113.10

There are no chirality outliers.

There are no planarity outliers.

### 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	2933	0	2982	99	0
1	B	2933	0	2982	104	0
2	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1	0	0	0	0
3	A	103	0	0	4	0
3	B	85	0	0	6	0
All	All	6056	0	5964	201	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 17.

All (201) 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:356:THR:H	1:A:359:GLN:HE21	1.18	0.88
1:A:450:VAL:HG13	1:A:457:LEU:HD11	1.59	0.82
1:B:446:LYS:HG2	1:B:467:GLN:NE2	1.95	0.81
1:A:415:ASN:HD21	1:A:420:ARG:HH11	1.27	0.81
1:B:415:ASN:ND2	1:B:420:ARG:HD2	1.97	0.80
1:A:311:PRO:HG2	1:A:374:ILE:HD13	1.64	0.79
1:B:533:VAL:HG13	1:B:537:LEU:HD23	1.64	0.78
1:B:446:LYS:HG2	1:B:467:GLN:HE21	1.48	0.77
1:B:560:SER:OG	1:B:624:GLY:HA2	1.86	0.76
1:B:483:ARG:H	1:B:483:ARG:HD2	1.51	0.76
1:B:284:ASP:HB3	1:B:287:LEU:HB3	1.69	0.75
1:A:432:LYS:HE2	1:A:527:THR:HG23	1.69	0.74
1:A:415:ASN:ND2	1:A:420:ARG:HD2	2.02	0.72
1:B:415:ASN:HD21	1:B:420:ARG:HH11	1.35	0.72
1:B:508:ASN:ND2	1:B:518:THR:HG23	2.05	0.72
1:A:285:VAL:HG21	1:A:338:GLN:NE2	2.05	0.72
1:B:450:VAL:HG13	1:B:457:LEU:HD11	1.72	0.72
1:B:311:PRO:HG2	1:B:374:ILE:HD13	1.73	0.70
1:A:356:THR:OG1	1:A:359:GLN:HG3	1.92	0.70
1:B:350:VAL:O	1:B:354:GLN:HG3	1.92	0.69
1:A:356:THR:H	1:A:359:GLN:NE2	1.91	0.69
1:B:560:SER:HG	1:B:624:GLY:HA2	1.57	0.68
1:A:415:ASN:HD21	1:A:420:ARG:HD2	1.62	0.64
1:B:538:GLN:HE22	1:B:544:GLN:NE2	1.95	0.64
1:A:453:PRO:HG2	1:A:456:ARG:NH1	2.12	0.64
1:A:407:ASP:O	1:A:410:LYS:HG2	1.98	0.63
1:B:453:PRO:HG2	1:B:456:ARG:HD2	1.80	0.63
1:B:529:ASN:O	1:B:530:GLU:HB2	1.98	0.63
1:A:447:ALA:O	1:A:448:LEU:HD23	1.98	0.63
1:A:416:ILE:O	1:A:420:ARG:HG2	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:609:LEU:HD13	1:B:613:GLN:HG2	1.81	0.62
1:B:415:ASN:HD21	1:B:420:ARG:NH1	1.98	0.62
1:A:400:LYS:O	1:A:404:VAL:HG23	2.00	0.62
1:B:415:ASN:ND2	1:B:523:PRO:HG3	2.16	0.61
1:B:285:VAL:HG22	1:B:341:VAL:HG21	1.82	0.60
1:B:419:LYS:HA	1:B:542:VAL:HB	1.81	0.60
1:A:419:LYS:HA	1:A:542:VAL:HB	1.85	0.59
1:B:356:THR:OG1	1:B:359:GLN:HG3	2.02	0.59
1:A:420:ARG:HB3	1:A:523:PRO:HB3	1.83	0.59
1:B:351:ASP:HB3	1:B:355:LEU:HD12	1.85	0.58
1:A:500:TYR:CE2	1:A:507:VAL:HG11	2.38	0.58
1:B:415:ASN:HD21	1:B:420:ARG:HD2	1.65	0.58
1:A:529:ASN:O	1:A:530:GLU:HB2	2.03	0.58
1:B:432:LYS:HE2	1:B:527:THR:HG23	1.85	0.58
1:A:268:VAL:HG22	1:A:326:ILE:HG22	1.85	0.57
1:B:389:ALA:HB1	1:B:625:VAL:HG21	1.86	0.57
1:A:583:ARG:HD2	1:A:587:GLU:OE1	2.05	0.57
1:B:272:LEU:HD22	1:B:320:HIS:CE1	2.40	0.56
1:B:450:VAL:HG12	1:B:450:VAL:O	2.04	0.56
1:A:508:ASN:ND2	1:A:518:THR:HG23	2.20	0.56
1:A:402:ASP:HA	1:A:578:MET:HE3	1.88	0.56
1:A:327:PHE:CZ	1:A:333:GLN:HB3	2.41	0.56
1:A:434:THR:HG23	1:A:570:GLN:HG3	1.88	0.55
1:A:462:GLY:HA3	1:A:510:GLU:O	2.06	0.55
1:B:452:LEU:HB3	1:B:453:PRO:CD	2.37	0.55
1:A:270:TRP:CE2	1:A:336:ILE:HG12	2.41	0.55
1:A:402:ASP:HA	1:A:578:MET:CE	2.36	0.55
1:B:453:PRO:HD2	1:B:456:ARG:HB2	1.89	0.55
1:B:268:VAL:HG22	1:B:326:ILE:HG22	1.89	0.55
1:B:423:LEU:HD11	1:B:528:MET:HE3	1.90	0.54
1:A:299:PHE:C	1:A:301:MET:H	2.10	0.54
1:A:480:GLY:O	1:A:485:LEU:HB2	2.08	0.54
1:A:508:ASN:HD22	1:A:518:THR:HG23	1.73	0.54
1:A:432:LYS:HB3	1:A:547:PHE:CD1	2.43	0.54
1:A:398:LEU:HD21	1:A:545:ILE:HG21	1.89	0.54
1:A:432:LYS:HE3	1:A:528:MET:O	2.08	0.54
1:B:508:ASN:HD22	1:B:508:ASN:N	2.05	0.54
1:A:351:ASP:HB3	1:A:355:LEU:HD12	1.90	0.53
1:A:508:ASN:HD22	1:A:508:ASN:N	2.04	0.53
1:B:432:LYS:HE3	1:B:528:MET:O	2.09	0.53
1:B:469:LEU:C	1:B:469:LEU:HD12	2.29	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:585:VAL:HG21	1:B:597:VAL:HG22	1.90	0.53
1:A:284:ASP:HB3	1:A:287:LEU:HB3	1.91	0.53
1:A:615:MET:HB3	1:A:625:VAL:CG1	2.39	0.53
1:B:500:TYR:CE2	1:B:507:VAL:HG11	2.44	0.53
1:B:425:LYS:HE2	1:B:530:GLU:HA	1.91	0.53
1:B:612:TYR:HA	1:B:615:MET:HE3	1.90	0.53
1:A:361:LEU:HD11	1:A:409:LEU:HD22	1.90	0.52
1:B:424:PHE:CE1	1:B:545:ILE:HD12	2.45	0.52
1:B:303:LEU:HG	3:B:118:HOH:O	2.10	0.52
1:B:538:GLN:NE2	1:B:544:GLN:NE2	2.58	0.52
1:B:608:SER:OG	1:B:611:VAL:HG23	2.09	0.51
1:A:346:ALA:HB2	1:B:289:LEU:HD23	1.92	0.51
1:B:462:GLY:HA3	1:B:510:GLU:O	2.11	0.51
1:A:583:ARG:HD3	1:A:584:PRO:HD2	1.92	0.51
1:B:397:LEU:O	1:B:398:LEU:HD12	2.10	0.51
1:B:602:ARG:HH11	1:B:602:ARG:HG3	1.75	0.51
1:B:307:LYS:HD3	3:B:88:HOH:O	2.11	0.50
1:B:402:ASP:HA	1:B:578:MET:CE	2.42	0.50
1:A:375:MET:HB3	1:A:382:ALA:CB	2.40	0.50
1:A:299:PHE:CE1	1:A:318:GLU:HG2	2.47	0.50
1:B:387:TRP:CE3	1:B:568:ILE:HG23	2.46	0.50
1:A:393:TRP:CE2	1:A:553:LEU:HD22	2.46	0.49
1:A:507:VAL:O	1:A:518:THR:HA	2.11	0.49
1:A:602:ARG:HH11	1:A:602:ARG:HG3	1.77	0.49
1:B:454:LEU:HG	1:B:454:LEU:O	2.12	0.49
1:A:384:ILE:HD11	1:A:603:LEU:HD11	1.93	0.49
1:A:469:LEU:C	1:A:469:LEU:HD12	2.33	0.49
1:A:615:MET:HB3	1:A:625:VAL:HG12	1.95	0.49
1:A:450:VAL:HG12	1:A:493:ASN:HB2	1.95	0.48
1:B:428:ILE:HG12	1:B:429:ASP:OD1	2.13	0.48
1:B:498:ARG:HB2	1:B:540:ARG:HE	1.79	0.48
1:A:357:ARG:HH11	1:A:357:ARG:HG2	1.78	0.48
1:A:555:HIS:HB3	1:A:559:ARG:NH1	2.28	0.48
1:A:305:CYS:HB2	3:A:184:HOH:O	2.13	0.48
1:A:585:VAL:HG23	3:A:168:HOH:O	2.13	0.48
1:B:349:ARG:HB2	1:B:349:ARG:HH11	1.78	0.48
1:A:375:MET:O	1:A:382:ALA:HB3	2.14	0.48
1:B:395:HIS:CE1	1:B:616:LYS:HZ1	2.31	0.48
1:B:513:HIS:O	1:B:514:LEU:HG	2.14	0.47
1:B:311:PRO:HG2	1:B:374:ILE:CD1	2.43	0.47
1:B:475:VAL:HG21	1:B:526:VAL:HG13	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:273:VAL:HG22	1:B:292:TYR:CE2	2.49	0.47
1:B:550:LYS:HD3	1:B:552:TYR:OH	2.15	0.47
1:A:285:VAL:HG22	1:A:341:VAL:HG21	1.97	0.47
1:B:511:LYS:HB3	1:B:516:LYS:HG3	1.96	0.47
1:A:425:LYS:HE2	1:A:530:GLU:HA	1.96	0.47
1:B:367:ASP:O	1:B:370:ASP:HB2	2.15	0.47
1:B:537:LEU:O	1:B:540:ARG:HB2	2.13	0.47
1:B:446:LYS:HB2	3:B:62:HOH:O	2.15	0.47
1:B:285:VAL:HG21	1:B:338:GLN:HE22	1.79	0.47
1:A:615:MET:O	1:A:619:VAL:HG23	2.15	0.46
1:B:602:ARG:HG3	1:B:602:ARG:NH1	2.30	0.46
1:A:593:GLN:O	1:A:597:VAL:HG23	2.14	0.46
1:A:299:PHE:CZ	1:A:318:GLU:HG2	2.51	0.46
1:A:440:LEU:HD21	1:A:445:GLY:O	2.16	0.46
1:A:268:VAL:HG21	1:A:330:SER:HB2	1.98	0.46
1:A:285:VAL:HG21	1:A:338:GLN:HE22	1.80	0.46
1:A:356:THR:HG23	1:A:359:GLN:NE2	2.31	0.46
1:A:302:CYS:SG	1:A:305:CYS:N	2.88	0.46
1:A:583:ARG:CD	1:A:587:GLU:OE1	2.63	0.46
1:A:304:LYS:HG2	1:A:309:GLU:OE1	2.17	0.45
1:B:385:GLU:HG2	1:B:607:PHE:HE2	1.81	0.45
1:A:478:THR:O	1:A:479:GLY:C	2.55	0.45
1:B:576:LEU:O	1:B:580:ILE:HG13	2.16	0.45
1:A:506:LYS:HB2	1:A:506:LYS:NZ	2.31	0.45
1:B:285:VAL:HG21	1:B:338:GLN:NE2	2.32	0.45
1:B:329:ASP:HA	3:B:20:HOH:O	2.17	0.45
1:A:280:THR:O	1:A:281:LYS:HB2	2.17	0.45
1:A:371:ARG:O	1:A:375:MET:HG3	2.17	0.45
1:B:280:THR:O	1:B:280:THR:HG22	2.17	0.44
1:B:448:LEU:HD21	1:B:463:VAL:HB	1.99	0.44
1:B:450:VAL:HG21	1:B:472:PHE:CD1	2.52	0.44
1:A:398:LEU:HB2	1:A:401:MET:CE	2.47	0.44
1:B:609:LEU:HD13	1:B:609:LEU:O	2.16	0.44
1:B:337:CYS:O	1:B:341:VAL:HG23	2.16	0.44
1:A:357:ARG:HG2	1:A:357:ARG:NH1	2.33	0.44
1:A:387:TRP:CE3	1:A:568:ILE:HG23	2.52	0.44
1:A:432:LYS:HE2	1:A:527:THR:CG2	2.41	0.44
1:A:417:PRO:HA	1:A:502:ASP:O	2.17	0.44
1:B:293:LEU:O	1:B:296:GLN:HG2	2.18	0.44
1:B:507:VAL:C	1:B:508:ASN:HD22	2.21	0.44
1:B:525:ILE:HG22	1:B:526:VAL:N	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:522:PRO:HA	1:B:523:PRO:HD3	1.81	0.44
1:B:585:VAL:HG13	1:B:593:GLN:HB3	2.00	0.44
1:B:346:ALA:O	1:B:350:VAL:HG23	2.17	0.43
1:A:448:LEU:HD22	1:A:463:VAL:HB	1.99	0.43
1:B:451:ASN:O	1:B:452:LEU:HD23	2.18	0.43
1:B:612:TYR:HA	1:B:615:MET:CE	2.47	0.43
1:A:375:MET:C	1:A:382:ALA:HB3	2.39	0.43
1:A:448:LEU:HG	1:A:470:VAL:HG13	1.99	0.43
1:A:281:LYS:HE3	1:A:367:ASP:OD1	2.17	0.43
1:B:402:ASP:HA	1:B:578:MET:HE1	2.00	0.43
1:A:455:ASP:CG	1:B:456:ARG:HH12	2.22	0.43
1:A:465:ILE:HD11	1:A:509:LEU:HB3	2.00	0.43
1:B:314:TYR:CE1	1:B:315:LYS:HG3	2.53	0.43
1:B:388:MET:CE	1:B:603:LEU:HD21	2.47	0.43
1:B:609:LEU:HD22	1:B:609:LEU:HA	1.78	0.43
1:A:356:THR:HG23	1:A:359:GLN:HE21	1.83	0.43
1:B:385:GLU:HG2	1:B:607:PHE:CE2	2.53	0.43
1:B:508:ASN:HD21	1:B:518:THR:HG23	1.80	0.43
1:B:554:LYS:O	1:B:558:GLU:HG3	2.19	0.43
1:A:423:LEU:HD11	1:A:528:MET:HE3	2.01	0.42
1:A:271:LYS:HE2	3:A:142:HOH:O	2.18	0.42
1:A:349:ARG:O	1:A:352:SER:HB3	2.20	0.42
1:A:408:PHE:CD2	1:A:439:LEU:HD22	2.53	0.42
1:A:406:TYR:CE1	1:A:587:GLU:HG2	2.53	0.42
1:A:450:VAL:HG12	1:A:450:VAL:O	2.19	0.42
1:A:304:LYS:HA	1:A:309:GLU:HG3	2.00	0.42
1:B:299:PHE:CE2	1:B:318:GLU:HG3	2.55	0.42
1:A:560:SER:OG	1:A:624:GLY:HA2	2.20	0.42
1:B:361:LEU:HD11	1:B:409:LEU:HD22	2.02	0.42
1:A:600:LYS:HG2	3:A:171:HOH:O	2.19	0.41
1:B:470:VAL:HG22	3:B:62:HOH:O	2.20	0.41
1:B:275:GLU:O	1:B:279:GLU:HG3	2.19	0.41
1:B:388:MET:HE3	1:B:603:LEU:HD21	2.01	0.41
1:A:508:ASN:ND2	1:A:508:ASN:N	2.68	0.41
1:A:513:HIS:O	1:A:514:LEU:HG	2.20	0.41
1:B:570:GLN:HG2	3:B:21:HOH:O	2.20	0.41
1:B:612:TYR:O	1:B:615:MET:HB2	2.21	0.41
1:A:299:PHE:C	1:A:301:MET:N	2.74	0.41
1:A:562:PHE:O	1:A:566:LYS:HB2	2.21	0.41
1:B:302:CYS:O	1:B:306:ILE:HG13	2.21	0.41
1:B:402:ASP:HA	1:B:578:MET:HE3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:460:GLU:O	1:A:463:VAL:HG23	2.21	0.41
1:A:414:TYR:O	1:A:415:ASN:C	2.59	0.40
1:B:426:GLY:O	1:B:427:PRO:O	2.40	0.40
1:A:340:ALA:O	1:A:343:THR:HB	2.21	0.40
1:B:408:PHE:CD2	1:B:439:LEU:HD22	2.56	0.40
1:B:410:LYS:HD3	1:B:410:LYS:HA	1.93	0.40
1:B:416:ILE:HA	1:B:417:PRO:HD3	1.98	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	360/377 (96%)	329 (91%)	24 (7%)	7 (2%)	6	13
1	B	360/377 (96%)	337 (94%)	16 (4%)	7 (2%)	6	13
All	All	720/754 (96%)	666 (92%)	40 (6%)	14 (2%)	6	13

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	480	GLY
1	B	427	PRO
1	A	454	LEU
1	A	479	GLY
1	B	481	GLU
1	B	488	GLY
1	A	300	GLU
1	B	486	PRO
1	A	301	MET
1	B	530	GLU
1	A	503	GLY

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Mol	Chain	Res	Type
1	A	561	GLU
1	B	454	LEU
1	B	624	GLY

### 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	323/336 (96%)	311 (96%)	12 (4%)	29	55
1	B	323/336 (96%)	305 (94%)	18 (6%)	17	38
All	All	646/672 (96%)	616 (95%)	30 (5%)	23	46

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	278	MET
1	A	299	PHE
1	A	318	GLU
1	A	329	ASP
1	A	349	ARG
1	A	361	LEU
1	A	440	LEU
1	A	509	LEU
1	A	535	LYS
1	A	570	GLN
1	A	602	ARG
1	A	603	LEU
1	B	299	PHE
1	B	300	GLU
1	B	349	ARG
1	B	361	LEU
1	B	420	ARG
1	B	455	ASP
1	B	460	GLU
1	B	469	LEU

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Mol	Chain	Res	Type
1	B	474	ASP
1	B	483	ARG
1	B	499	ASP
1	B	502	ASP
1	B	517	ARG
1	B	561	GLU
1	B	570	GLN
1	B	583	ARG
1	B	602	ARG
1	B	625	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	267	GLN
1	A	338	GLN
1	A	359	GLN
1	A	415	ASN
1	A	467	GLN
1	A	508	ASN
1	A	529	ASN
1	A	544	GLN
1	B	333	GLN
1	B	338	GLN
1	B	415	ASN
1	B	467	GLN
1	B	508	ASN
1	B	529	ASN
1	B	544	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 [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

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 [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.