



# Full wwPDB X-ray Structure Validation Report ⓘ

May 18, 2020 – 07:22 am BST

PDB ID : 1KZZ  
Title : DOWNSTREAM REGULATOR TANK BINDS TO THE CD40 RECOGNITION SITE ON TRAF3  
Authors : Li, C.; Ni, C.-Z.; Havert, M.L.; Cabezas, E.; He, J.; Kaiser, D.; Reed, J.C.; Satterthwait, A.C.; Cheng, G.; Ely, K.R.  
Deposited on : 2002-02-08  
Resolution : 3.50 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](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.

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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  
Xtrriage (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

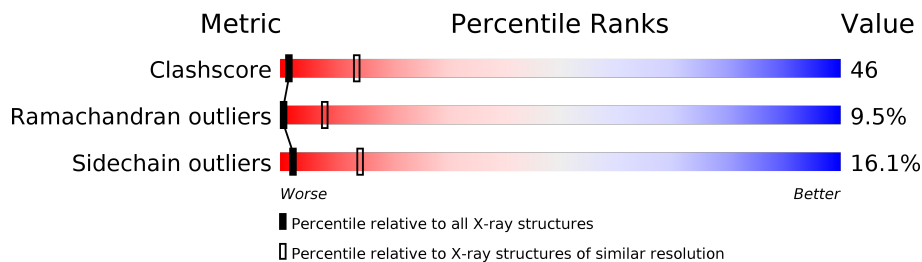
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.50 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	141614	1036 (3.58-3.42)
Ramachandran outliers	138981	1005 (3.58-3.42)
Sidechain outliers	138945	1006 (3.58-3.42)

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  $\geq 3$ , 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	192	 32% 51% 16% .
2	B	11	 55% 27% 18%

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 1613 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 TNF receptor associated factor 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	192	1532	979	259	283	11	0	0	0

- Molecule 2 is a protein called TRAF family member-associated NF-kappa-b activator.

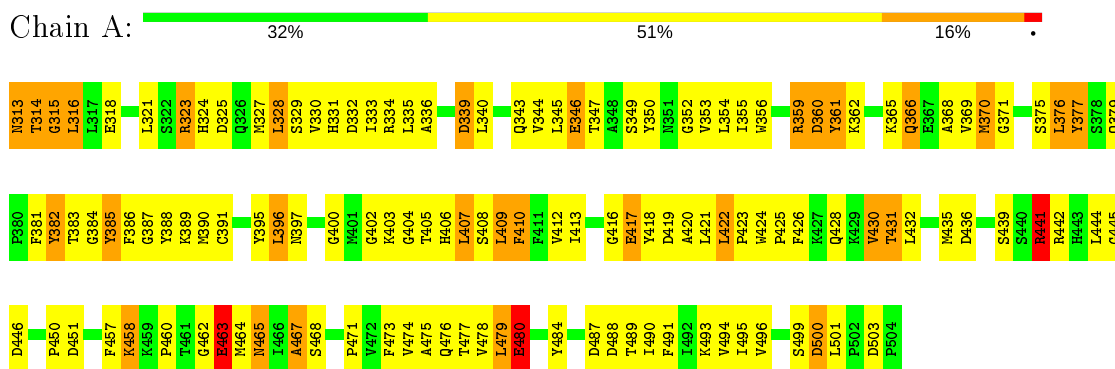
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	11	81	48	13	18	2	0	0	0

### 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: TNF receptor associated factor 3



- Molecule 2: TRAF family member-associated NF-kappa-b activator



## 4 Data and refinement statistics

Xtrriage (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, $\alpha$ , $\beta$ , $\gamma$	82.50Å 82.50Å 77.90Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	50.00 - 3.50	Depositor
% Data completeness (in resolution range)	(Not available) (50.00-3.50)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	CNS	Depositor
R, $R_{free}$	0.225 , 0.307	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	1613	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	16.0	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	0.49	0/1567	0.72	0/2113
2	B	0.78	0/81	0.71	0/108
All	All	0.51	0/1648	0.72	0/2221

There are no bond length outliers.

There are no bond angle outliers.

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	1532	0	1526	145	0
2	B	81	0	83	5	0
All	All	1613	0	1609	147	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 46.

All (147) 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:409:LEU:HD11	1:A:432:LEU:HD22	1.57	0.86
1:A:430:VAL:HG12	1:A:431:THR:H	1.41	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:382:TYR:HE2	1:A:389:LYS:HG3	1.42	0.83
1:A:382:TYR:HD2	1:A:389:LYS:HA	1.39	0.83
1:A:477:THR:HG23	1:A:478:VAL:H	1.44	0.80
1:A:382:TYR:CE2	1:A:389:LYS:HG3	2.18	0.79
1:A:359:ARG:HH11	1:A:359:ARG:HG3	1.46	0.79
1:A:376:LEU:N	1:A:376:LEU:HD12	1.99	0.78
1:A:407:LEU:HD23	1:A:408:SER:N	1.98	0.77
1:A:313:ASN:HB3	1:A:316:LEU:HB2	1.66	0.77
1:A:352:GLY:HA2	1:A:383:THR:HG22	1.69	0.74
1:A:382:TYR:CD2	1:A:389:LYS:HA	2.21	0.73
1:A:407:LEU:C	1:A:407:LEU:HD23	2.09	0.72
1:A:333:ILE:O	1:A:336:ALA:HB3	1.90	0.71
1:A:430:VAL:HG12	1:A:431:THR:N	2.05	0.70
1:A:376:LEU:H	1:A:376:LEU:HD12	1.58	0.68
1:A:477:THR:HG23	1:A:478:VAL:N	2.09	0.66
1:A:444:LEU:HD23	1:A:445:GLY:N	2.12	0.65
1:A:445:GLY:HA2	1:A:473:PHE:CZ	2.31	0.64
1:A:405:THR:O	1:A:476:GLN:HG3	1.97	0.64
1:A:493:LYS:HD3	1:A:495:ILE:HD11	1.79	0.63
1:A:352:GLY:CA	1:A:383:THR:HG22	2.28	0.63
1:A:409:LEU:HD12	1:A:409:LEU:C	2.19	0.63
1:A:484:TYR:O	1:A:490:ILE:HG22	1.99	0.63
1:A:345:LEU:O	1:A:347:THR:N	2.33	0.62
1:A:356:TRP:HH2	1:A:376:LEU:O	1.83	0.62
1:A:313:ASN:C	1:A:315:GLY:H	2.03	0.61
2:B:9:ASP:O	2:B:10:LYS:HG3	2.01	0.61
1:A:315:GLY:HA2	1:A:318:GLU:HG3	1.83	0.60
1:A:365:LYS:O	1:A:368:ALA:N	2.33	0.60
1:A:345:LEU:HD12	1:A:345:LEU:H	1.66	0.60
1:A:426:PHE:HB3	1:A:457:PHE:HB3	1.85	0.59
1:A:473:PHE:HD2	1:A:474:VAL:HG23	1.69	0.58
1:A:450:PRO:HB3	1:A:457:PHE:CZ	2.38	0.58
1:A:314:THR:HG23	1:A:314:THR:O	2.05	0.57
1:A:359:ARG:NH1	1:A:359:ARG:HG3	2.16	0.57
1:A:479:LEU:HG	1:A:480:GLU:N	2.20	0.57
1:A:487:ASP:O	1:A:489:THR:HG22	2.05	0.56
1:A:409:LEU:CD1	1:A:432:LEU:HD22	2.33	0.56
1:A:375:SER:HB3	1:A:395:TYR:CD2	2.40	0.56
1:A:467:ALA:O	2:B:6:GLN:HG3	2.06	0.56
1:A:405:THR:C	1:A:476:GLN:HG3	2.26	0.55
1:A:430:VAL:CG1	1:A:431:THR:H	2.05	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:435:MET:HE2	1:A:493:LYS:HE3	1.88	0.55
1:A:416:GLY:O	1:A:418:TYR:N	2.41	0.54
1:A:410:PHE:N	1:A:410:PHE:CD1	2.75	0.54
1:A:355:ILE:HD11	1:A:493:LYS:HE3	1.89	0.54
1:A:359:ARG:O	1:A:360:ASP:HB2	2.08	0.54
1:A:460:PRO:HA	1:A:465:ASN:OD1	2.08	0.54
1:A:354:LEU:HD12	1:A:355:ILE:H	1.73	0.53
1:A:442:ARG:HG3	1:A:442:ARG:HH11	1.74	0.53
1:A:413:ILE:HD11	1:A:426:PHE:CG	2.44	0.53
1:A:354:LEU:HD22	1:A:381:PHE:CD1	2.44	0.52
1:A:436:ASP:HA	1:A:484:TYR:HD1	1.73	0.52
1:A:340:LEU:HD12	1:A:343:GLN:NE2	2.24	0.52
1:A:313:ASN:HD22	1:A:314:THR:N	2.08	0.52
1:A:417:GLU:OE1	1:A:417:GLU:HA	2.09	0.52
1:A:365:LYS:O	1:A:368:ALA:HB3	2.10	0.52
1:A:361:TYR:O	1:A:362:LYS:C	2.47	0.52
2:B:8:THR:O	2:B:8:THR:HG22	2.10	0.52
1:A:408:SER:OG	1:A:471:PRO:HA	2.11	0.51
1:A:384:GLY:O	1:A:386:PHE:N	2.44	0.51
1:A:361:TYR:N	1:A:488:ASP:OD2	2.44	0.50
1:A:345:LEU:O	1:A:346:GLU:C	2.50	0.50
1:A:396:LEU:HD23	1:A:396:LEU:N	2.26	0.50
1:A:382:TYR:HB3	1:A:388:TYR:O	2.12	0.49
1:A:431:THR:HB	1:A:495:ILE:HB	1.95	0.49
1:A:403:LYS:O	1:A:405:THR:HG23	2.13	0.49
1:A:407:LEU:C	1:A:407:LEU:CD2	2.77	0.49
1:A:462:GLY:O	1:A:464:MET:N	2.45	0.49
1:A:468:SER:CB	2:B:6:GLN:HE21	2.25	0.49
1:A:473:PHE:CD2	1:A:474:VAL:HG23	2.47	0.49
1:A:432:LEU:HD23	1:A:494:VAL:HG22	1.93	0.49
1:A:406:HIS:HB3	1:A:474:VAL:O	2.13	0.48
1:A:327:MET:O	1:A:330:VAL:HB	2.13	0.48
1:A:410:PHE:HB3	1:A:468:SER:H	1.79	0.48
1:A:388:TYR:HB2	1:A:390:MET:HE2	1.96	0.47
1:A:387:GLY:C	1:A:422:LEU:HD21	2.34	0.47
1:A:400:GLY:H	1:A:403:LYS:HE3	1.79	0.47
1:A:334:ARG:C	1:A:336:ALA:N	2.66	0.47
1:A:369:VAL:C	1:A:371:GLY:N	2.67	0.47
1:A:354:LEU:HD12	1:A:355:ILE:N	2.29	0.47
1:A:334:ARG:O	1:A:335:LEU:C	2.52	0.47
1:A:445:GLY:HA2	1:A:473:PHE:HZ	1.78	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:475:ALA:HB1	1:A:477:THR:HG22	1.97	0.47
1:A:408:SER:CB	1:A:471:PRO:HA	2.45	0.46
1:A:330:VAL:O	1:A:331:HIS:C	2.53	0.46
1:A:499:SER:C	1:A:501:LEU:H	2.19	0.46
1:A:501:LEU:HD23	1:A:501:LEU:C	2.36	0.46
1:A:377:TYR:CD1	1:A:377:TYR:N	2.84	0.46
1:A:384:GLY:O	1:A:385:TYR:C	2.54	0.45
1:A:315:GLY:CA	1:A:318:GLU:HG3	2.47	0.45
1:A:350:TYR:CD1	1:A:350:TYR:N	2.84	0.45
1:A:462:GLY:O	1:A:463:GLU:C	2.54	0.45
1:A:390:MET:SD	1:A:496:VAL:HG21	2.57	0.45
1:A:345:LEU:H	1:A:345:LEU:CD1	2.29	0.45
1:A:379:GLN:O	1:A:379:GLN:HG2	2.17	0.45
1:A:475:ALA:HB3	1:A:478:VAL:HB	1.99	0.45
1:A:409:LEU:HD12	1:A:410:PHE:N	2.32	0.44
1:A:405:THR:OG1	1:A:406:HIS:CD2	2.71	0.44
1:A:424:TRP:HA	1:A:425:PRO:C	2.37	0.44
1:A:323:ARG:NH1	1:A:324:HIS:NE2	2.66	0.44
1:A:313:ASN:O	1:A:315:GLY:N	2.50	0.44
1:A:412:VAL:HG12	1:A:413:ILE:N	2.33	0.44
1:A:410:PHE:HB3	1:A:468:SER:C	2.38	0.44
1:A:408:SER:OG	1:A:471:PRO:O	2.31	0.44
1:A:365:LYS:O	1:A:366:GLN:C	2.57	0.44
1:A:329:SER:O	1:A:333:ILE:HG13	2.18	0.43
1:A:336:ALA:O	1:A:339:ASP:HB2	2.17	0.43
1:A:359:ARG:O	1:A:360:ASP:CB	2.66	0.43
1:A:457:PHE:O	1:A:458:LYS:O	2.37	0.43
1:A:468:SER:HA	2:B:6:GLN:HE21	1.83	0.43
1:A:353:VAL:HG12	1:A:354:LEU:N	2.34	0.43
1:A:402:GLY:O	1:A:403:LYS:C	2.57	0.43
1:A:476:GLN:HE21	1:A:476:GLN:HB3	1.59	0.43
1:A:477:THR:CG2	1:A:478:VAL:H	2.22	0.43
1:A:430:VAL:O	1:A:495:ILE:O	2.37	0.43
1:A:366:GLN:OE1	1:A:370:MET:CE	2.67	0.43
1:A:439:SER:O	1:A:441:ARG:HG3	2.19	0.43
1:A:369:VAL:C	1:A:371:GLY:H	2.23	0.43
1:A:430:VAL:O	1:A:431:THR:CB	2.67	0.42
1:A:359:ARG:CG	1:A:359:ARG:NH1	2.81	0.42
1:A:428:GLN:CD	1:A:501:LEU:HD12	2.39	0.42
1:A:403:LYS:O	1:A:405:THR:N	2.52	0.42
1:A:419:ASP:HB3	1:A:424:TRP:HZ2	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:381:PHE:O	1:A:390:MET:HG3	2.20	0.42
1:A:428:GLN:OE1	1:A:501:LEU:HD12	2.20	0.42
1:A:331:HIS:O	1:A:332:ASP:C	2.58	0.41
1:A:477:THR:CG2	1:A:478:VAL:N	2.79	0.41
1:A:501:LEU:CD2	1:A:501:LEU:C	2.88	0.41
1:A:331:HIS:O	1:A:334:ARG:N	2.53	0.41
1:A:419:ASP:HB3	1:A:424:TRP:CZ2	2.55	0.41
1:A:313:ASN:C	1:A:315:GLY:N	2.71	0.41
1:A:345:LEU:C	1:A:347:THR:N	2.72	0.41
1:A:369:VAL:HG22	1:A:397:ASN:ND2	2.35	0.41
1:A:491:PHE:CD1	1:A:491:PHE:N	2.89	0.41
1:A:334:ARG:O	1:A:336:ALA:N	2.53	0.41
1:A:388:TYR:OH	1:A:423:PRO:HD2	2.21	0.41
1:A:375:SER:HB3	1:A:395:TYR:CE2	2.56	0.41
1:A:324:HIS:O	1:A:328:LEU:HB2	2.20	0.41
1:A:413:ILE:HD11	1:A:426:PHE:CD2	2.56	0.40
1:A:330:VAL:O	1:A:333:ILE:HB	2.20	0.40
1:A:420:ALA:O	1:A:421:LEU:HD23	2.21	0.40
1:A:390:MET:HE1	1:A:426:PHE:CE2	2.57	0.40
1:A:396:LEU:CD2	1:A:396:LEU:N	2.84	0.40
1:A:405:THR:OG1	1:A:406:HIS:N	2.54	0.40
1:A:499:SER:OG	1:A:500:ASP:OD1	2.39	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	190/192 (99%)	138 (73%)	34 (18%)	18 (10%)	0 8
2	B	9/11 (82%)	4 (44%)	4 (44%)	1 (11%)	0 6
All	All	199/203 (98%)	142 (71%)	38 (19%)	19 (10%)	0 8

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	430	VAL
1	A	431	THR
1	A	458	LYS
1	A	463	GLU
1	A	465	ASN
1	A	346	GLU
1	A	360	ASP
1	A	385	TYR
1	A	404	GLY
1	A	417	GLU
1	A	441	ARG
2	B	10	LYS
1	A	314	THR
1	A	361	TYR
1	A	479	LEU
1	A	467	ALA
1	A	480	GLU
1	A	315	GLY
1	A	344	VAL

### 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	169/169 (100%)	142 (84%)	27 (16%)	2	14
2	B	11/11 (100%)	9 (82%)	2 (18%)	1	9
All	All	180/180 (100%)	151 (84%)	29 (16%)	2	14

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	313	ASN
1	A	316	LEU
1	A	321	LEU
1	A	323	ARG

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Mol	Chain	Res	Type
1	A	325	ASP
1	A	328	LEU
1	A	339	ASP
1	A	349	SER
1	A	359	ARG
1	A	366	GLN
1	A	370	MET
1	A	376	LEU
1	A	377	TYR
1	A	382	TYR
1	A	391	CYS
1	A	396	LEU
1	A	407	LEU
1	A	409	LEU
1	A	410	PHE
1	A	422	LEU
1	A	441	ARG
1	A	446	ASP
1	A	451	ASP
1	A	463	GLU
1	A	480	GLU
1	A	500	ASP
1	A	503	ASP
2	B	2	SER
2	B	9	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	313	ASN
1	A	343	GLN
1	A	406	HIS
1	A	428	GLN
1	A	476	GLN
1	A	481	ASN
2	B	6	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

### 6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.