



# Full wwPDB/EMDatabank EM Map/Model Validation Report ⓘ

Jul 11, 2018 – 06:47 PM EDT

PDB ID : 3IYG  
EMDB ID: : EMD-5148  
Title : Ca model of bovine TRiC/CCT derived from a 4.0 Angstrom cryo-EM map  
Authors : Cong, Y.; Baker, M.L.; Ludtke, S.J.; Frydman, J.; Chiu, W.  
Deposited on : 2009-11-28  
Resolution : 4.00 Å(reported)

This is a Full wwPDB/EMDatabank EM Map/Model Validation Report  
for a publicly released PDB/EMDB 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/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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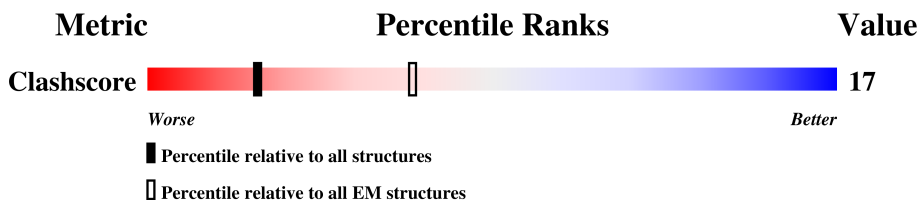
MolProbity : 4.02b-467  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20031172

# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.00 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)	EM structures (#Entries)
Clashscore	136327	1886

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	Q	512	 97% .
2	G	515	 98% .
3	Z	517	 97% .
4	D	518	 96% .
5	B	513	 95% 5% .
6	E	515	 97% .
7	A	529	 98% .
8	H	515	 98% .

## 2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 4134 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 T-complex protein 1 subunit theta.

Mol	Chain	Residues	Atoms	AltConf	Trace
1	Q	512	Total C 512 512	0	512

- Molecule 2 is a protein called T-complex protein 1 subunit gamma.

Mol	Chain	Residues	Atoms	AltConf	Trace
2	G	515	Total C 515 515	0	515

- Molecule 3 is a protein called T-complex protein 1 subunit zeta.

Mol	Chain	Residues	Atoms	AltConf	Trace
3	Z	517	Total C 517 517	0	517

- Molecule 4 is a protein called T-complex protein 1 subunit delta.

Mol	Chain	Residues	Atoms	AltConf	Trace
4	D	518	Total C 518 518	0	518

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	134	VAL	GLU	CONFLICT	UNP Q2T9X2
D	486	LEU	GLN	CONFLICT	UNP Q2T9X2

- Molecule 5 is a protein called T-complex protein 1 subunit beta.

Mol	Chain	Residues	Atoms	AltConf	Trace
5	B	513	Total C 513 513	0	513

- Molecule 6 is a protein called T-complex protein 1 subunit.

Mol	Chain	Residues	Atoms		AltConf	Trace
6	E	515	Total	C	0	515
			515	515		

- Molecule 7 is a protein called T-complex protein 1 subunit alpha.

Mol	Chain	Residues	Atoms		AltConf	Trace
7	A	529	Total	C	0	529
			529	529		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	440	LEU	PRO	CONFLICT	UNP Q32L40

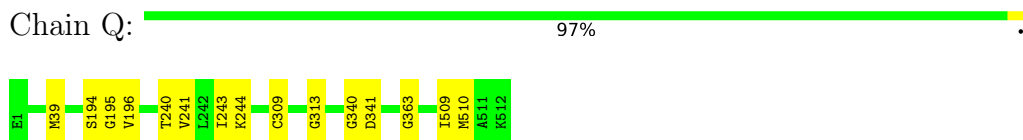
- Molecule 8 is a protein called T-complex protein 1 subunit eta.

Mol	Chain	Residues	Atoms		AltConf	Trace
8	H	515	Total	C	0	515
			515	515		

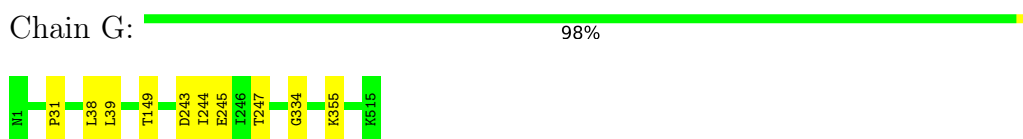
### 3 Residue-property plots [i](#)

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.

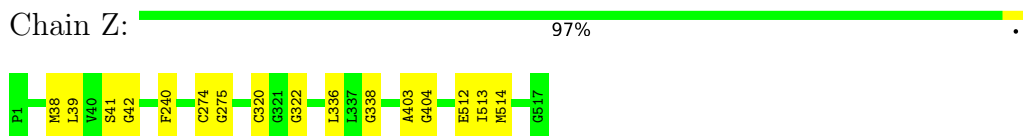
- Molecule 1: T-complex protein 1 subunit theta



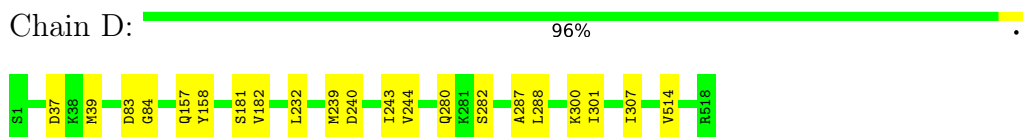
- Molecule 2: T-complex protein 1 subunit gamma



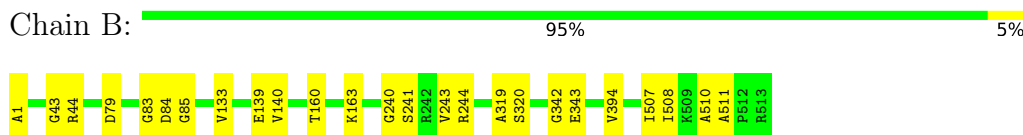
- Molecule 3: T-complex protein 1 subunit zeta



- Molecule 4: T-complex protein 1 subunit delta

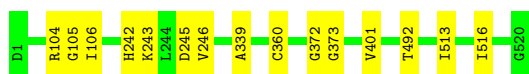


- Molecule 5: T-complex protein 1 subunit beta



- Molecule 6: T-complex protein 1 subunit





- Molecule 7: T-complex protein 1 subunit alpha

Chain A:  98%



- Molecule 8: T-complex protein 1 subunit eta

Chain H:  98%



## 4 Experimental information

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	101000	Depositor
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	each micrograph	Depositor
Microscope	JEOL 3200FSC	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	18	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	50000	Depositor
Image detector	KODAK SO-163 FILM	Depositor

## 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).

There are no protein, RNA or DNA chains available to summarize Z scores of covalent bonds and angles.

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	Q	512	0	0	11	0
2	G	515	0	0	9	0
3	Z	517	0	0	15	0
4	D	518	0	0	17	0
5	B	513	0	0	21	0
6	E	515	0	0	12	0
7	A	529	0	0	9	0
8	H	515	0	0	7	0
All	All	4134	0	0	72	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 (72) 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)
4:D:232:LEU:CA	4:D:288:LEU:CA	2.22	1.16

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:A:520:ARG:CA	8:H:36:MET:CA	2.25	1.14
3:Z:41:SER:CA	5:B:510:ALA:CA	2.26	1.13
1:Q:243:ILE:CA	4:D:243:ILE:CA	2.27	1.12
5:B:1:ALA:CA	5:B:511:ALA:CA	2.30	1.08
8:H:177:LEU:CA	8:H:182:GLN:CA	2.31	1.07
3:Z:513:ILE:CA	7:A:39:LEU:CA	2.36	1.03
3:Z:42:GLY:CA	5:B:510:ALA:CA	2.38	1.01
4:D:244:VAL:CA	6:E:242:HIS:CA	2.38	1.00
6:E:339:ALA:CA	6:E:360:CYS:CA	2.39	0.99
4:D:282:SER:CA	4:D:288:LEU:CA	2.41	0.97
3:Z:240:PHE:CA	5:B:241:SER:CA	2.48	0.91
1:Q:39:MET:CA	4:D:514:VAL:CA	2.49	0.90
3:Z:514:MET:CA	7:A:39:LEU:CA	2.50	0.88
3:Z:39:LEU:CA	5:B:508:ILE:CA	2.53	0.86
4:D:244:VAL:CA	6:E:243:LYS:CA	2.55	0.84
4:D:243:ILE:CA	6:E:242:HIS:CA	2.56	0.84
6:E:245:ASP:CA	8:H:244:ALA:CA	2.58	0.81
5:B:43:GLY:CA	5:B:44:ARG:CA	2.60	0.79
4:D:39:MET:CA	6:E:516:ILE:CA	2.60	0.79
1:Q:196:VAL:CA	1:Q:363:GLY:CA	2.61	0.78
1:Q:244:LYS:CA	4:D:243:ILE:CA	2.63	0.77
2:G:243:ASP:CA	5:B:243:VAL:CA	2.64	0.76
5:B:139:GLU:CA	5:B:140:VAL:CA	2.64	0.75
2:G:243:ASP:CA	5:B:244:ARG:CA	2.64	0.75
3:Z:38:MET:CA	5:B:507:ILE:CA	2.66	0.73
5:B:83:GLY:CA	5:B:84:ASP:CA	2.67	0.73
1:Q:241:VAL:CA	2:G:247:THR:CA	2.67	0.72
1:Q:340:GLY:CA	1:Q:341:ASP:CA	2.68	0.71
3:Z:513:ILE:CA	7:A:38:MET:CA	2.70	0.70
8:H:35:GLY:CA	8:H:36:MET:CA	2.69	0.69
3:Z:512:GLU:CA	7:A:37:LYS:CA	2.73	0.67
3:Z:240:PHE:CA	5:B:240:GLY:CA	2.73	0.67
1:Q:194:SER:CA	1:Q:195:GLY:CA	2.74	0.65
4:D:83:ASP:CA	4:D:84:GLY:CA	2.75	0.64
2:G:244:ILE:CA	5:B:244:ARG:CA	2.75	0.63
5:B:84:ASP:CA	5:B:85:GLY:CA	2.78	0.62
1:Q:240:THR:CA	2:G:245:GLU:CA	2.78	0.61
3:Z:403:ALA:CA	3:Z:404:GLY:CA	2.79	0.61
8:H:398:ALA:CA	8:H:484:TRP:CA	2.80	0.59
4:D:300:LYS:CA	4:D:301:ILE:CA	2.80	0.58
4:D:287:ALA:CA	4:D:288:LEU:CA	2.82	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:239:MET:CA	4:D:240:ASP:CA	2.82	0.57
5:B:79:ASP:CA	5:B:83:GLY:CA	2.82	0.57
2:G:334:GLY:CA	2:G:355:LYS:CA	2.81	0.57
5:B:342:GLY:CA	5:B:343:GLU:CA	2.84	0.55
6:E:246:VAL:CA	8:H:245:GLU:CA	2.84	0.55
4:D:157:GLN:CA	4:D:158:TYR:CA	2.85	0.54
6:E:401:VAL:CA	6:E:492:THR:CA	2.85	0.54
4:D:181:SER:CA	4:D:182:VAL:CA	2.86	0.53
7:A:521:ILE:CA	7:A:522:ASP:CA	2.87	0.52
5:B:319:ALA:CA	5:B:320:SER:CA	2.88	0.52
7:A:337:SER:CA	7:A:338:MET:CA	2.88	0.51
8:H:33:PRO:CA	8:H:34:ARG:CA	2.89	0.50
3:Z:322:GLY:CA	3:Z:336:LEU:CA	2.90	0.49
4:D:280:GLN:CA	4:D:307:ILE:CA	2.91	0.49
1:Q:309:CYS:CA	1:Q:313:GLY:CA	2.91	0.48
6:E:105:GLY:CA	6:E:106:ILE:CA	2.91	0.48
1:Q:509:ILE:CA	2:G:38:LEU:CA	2.92	0.47
6:E:372:GLY:CA	6:E:373:GLY:CA	2.92	0.47
6:E:104:ARG:CA	6:E:105:GLY:CA	2.93	0.47
3:Z:42:GLY:CA	5:B:511:ALA:CA	2.93	0.46
5:B:240:GLY:CA	5:B:241:SER:CA	2.94	0.46
2:G:31:PRO:CA	2:G:149:THR:CA	2.94	0.46
7:A:283:THR:CA	7:A:284:GLY:CA	2.96	0.44
3:Z:274:CYS:CA	3:Z:275:GLY:CA	2.96	0.43
5:B:133:VAL:CA	5:B:394:VAL:CA	2.97	0.42
4:D:37:ASP:CA	6:E:513:ILE:CA	2.98	0.42
5:B:160:THR:CA	5:B:163:LYS:CA	2.98	0.41
1:Q:510:MET:CA	2:G:39:LEU:CA	2.99	0.41
3:Z:320:CYS:CA	3:Z:338:GLY:CA	2.99	0.41
7:A:81:GLY:CA	7:A:82:ASP:CA	2.99	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [\(i\)](#)

### 5.3.1 Protein backbone [\(i\)](#)

There are no protein backbone outliers to report in this entry.

### 5.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

### 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.