



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 01:48 PM UTC

PDB ID : 6YQF / pdb_00006yqf
Title : Crystal structure of the SYCE2-TEX12 delta-Ctip complex in a 4:4 assembly
Authors : Duncce, J.M.; Davies, O.R.
Deposited on : 2020-04-16
Resolution : 3.33 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
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

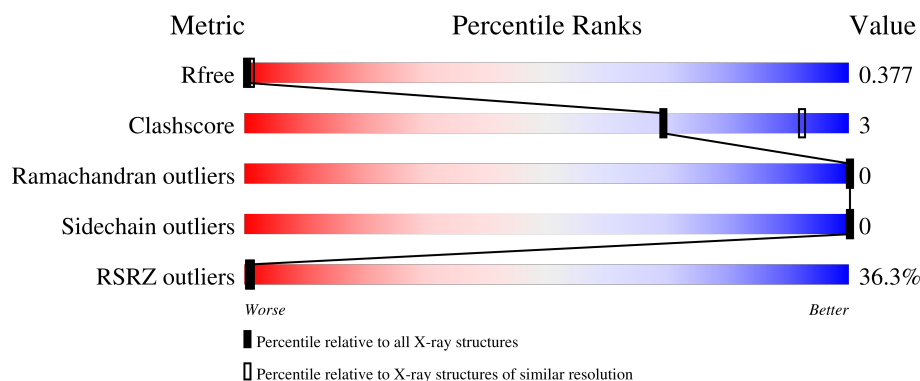
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.33 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))
R_{free}	180053	1434 (3.38-3.30)
Clashscore	190562	1479 (3.38-3.30)
Ramachandran outliers	187476	1456 (3.38-3.30)
Sidechain outliers	187428	1455 (3.38-3.30)
RSRZ outliers	180081	1434 (3.38-3.30)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	112	28% 77% 7% 16%
1	B	112	30% 72% 8% 20%
2	C	69	39% 80% 9% 12%
2	D	69	22% 67% 6% 28%

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 2426 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 Synaptonemal complex central element protein 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	94	Total	C	N	O	S	0	0	0
			781	489	137	152	3			
1	B	90	Total	C	N	O	S	0	0	0
			746	463	133	147	3			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	54	GLY	-	expression tag	UNP Q6PIF2
A	55	SER	-	expression tag	UNP Q6PIF2
A	56	MET	-	expression tag	UNP Q6PIF2
B	54	GLY	-	expression tag	UNP Q6PIF2
B	55	SER	-	expression tag	UNP Q6PIF2
B	56	MET	-	expression tag	UNP Q6PIF2

- Molecule 2 is a protein called Testis-expressed protein 12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	61	Total	C	N	O	S	0	0	0
			497	315	80	101	1			
2	D	50	Total	C	N	O	S	0	0	0
			402	254	65	82	1			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	45	GLY	-	expression tag	UNP Q9BXU0
C	46	SER	-	expression tag	UNP Q9BXU0
C	47	MET	-	expression tag	UNP Q9BXU0
C	48	GLY	-	expression tag	UNP Q9BXU0
D	45	GLY	-	expression tag	UNP Q9BXU0
D	46	SER	-	expression tag	UNP Q9BXU0

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Chain	Residue	Modelled	Actual	Comment	Reference
D	47	MET	-	expression tag	UNP Q9BXU0
D	48	GLY	-	expression tag	UNP Q9BXU0

4 Data and refinement statistics

Property	Value	Source
Space group	P 2 ₁ 2 ₁ 2	Depositor
Cell constants a, b, c, α , β , γ	42.67Å 59.68Å 156.49Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.45 – 3.33 47.45 – 3.33	Depositor EDS
% Data completeness (in resolution range)	64.1 (47.45-3.33) 65.0 (47.45-3.33)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.31 (at 3.33Å)	Xtriage
Refinement program	PHENIX 1.17.1 _3660	Depositor
R, R_{free}	0.327 , 0.367 0.333 , 0.377	Depositor DCC
R_{free} test set	205 reflections (1.50%)	wwPDB-VP
Wilson B-factor (Å ²)	70.3	Xtriage
Anisotropy	0.155	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 69.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	2426	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 20.26 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.0345e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	0.07	0/789	0.19	0/1054
1	B	0.07	0/752	0.19	0/1004
2	C	0.07	0/501	0.21	0/672
2	D	0.07	0/405	0.20	0/544
All	All	0.07	0/2447	0.20	0/3274

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	781	0	797	6	0
1	B	746	0	765	9	0
2	C	497	0	497	7	0
2	D	402	0	402	4	0
All	All	2426	0	2461	17	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 3.

All (17) 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:110:LEU:HD11	2:C:57:LEU:HD21	1.76	0.67
1:A:110:LEU:HD11	2:D:60:VAL:HG21	1.79	0.63
1:B:82:ASN:OD1	1:B:85:ARG:NH2	2.34	0.61
1:B:99:LEU:HD21	2:C:67:MET:HG2	1.85	0.58
1:A:90:ALA:O	1:A:94:ASN:ND2	2.37	0.57
1:A:92:MET:HE1	1:B:114:ILE:HD13	1.92	0.49
2:C:68:LEU:HD12	2:D:61:SER:HB3	1.92	0.49
1:A:80:ASN:O	1:A:84:SER:N	2.46	0.47
1:A:91:LEU:HD12	2:D:78:ARG:HH21	1.79	0.46
1:B:106:LEU:HD13	2:C:60:VAL:HG13	1.97	0.46
1:A:123:LYS:HE3	1:A:123:LYS:HB3	1.77	0.45
1:B:102:LYS:O	1:B:106:LEU:HG	2.16	0.45
1:B:143:GLU:HG2	1:B:147:LYS:HE3	2.00	0.43
2:C:56:ASP:O	2:C:60:VAL:HG23	2.19	0.43
1:B:106:LEU:HD22	2:C:60:VAL:HG22	2.03	0.41
1:B:114:ILE:HG12	2:D:75:LEU:HG	2.03	0.40
2:C:74:LEU:HA	2:C:74:LEU:HD23	1.88	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	92/112 (82%)	92 (100%)	0	0	100	100
1	B	88/112 (79%)	88 (100%)	0	0	100	100
2	C	59/69 (86%)	59 (100%)	0	0	100	100
2	D	48/69 (70%)	48 (100%)	0	0	100	100
All	All	287/362 (79%)	287 (100%)	0	0	100	100

There are no Ramachandran outliers to report.

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	90/107 (84%)	90 (100%)	0	100	100
1	B	87/107 (81%)	87 (100%)	0	100	100
2	C	54/60 (90%)	54 (100%)	0	100	100
2	D	44/60 (73%)	44 (100%)	0	100	100
All	All	275/334 (82%)	275 (100%)	0	100	100

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

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	80	ASN

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 oligosaccharides 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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	94/112 (83%)	1.82	31 (32%) 1 1	18, 47, 80, 103	0
1	B	90/112 (80%)	1.89	34 (37%) 1 1	28, 64, 92, 99	0
2	C	61/69 (88%)	1.86	27 (44%) 0 0	40, 57, 85, 92	0
2	D	50/69 (72%)	1.48	15 (30%) 1 1	25, 46, 65, 68	0
All	All	295/362 (81%)	1.79	107 (36%) 1 1	18, 54, 87, 103	0

All (107) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	89	ILE	8.3
2	C	77	GLU	8.1
1	B	106	LEU	7.2
2	C	89	ILE	6.9
1	A	131	GLU	6.6
1	A	63	LEU	6.5
2	C	95	GLU	5.6
1	B	129	LEU	5.5
1	B	132	PHE	5.4
2	D	71	TYR	5.3
1	A	113	ARG	5.2
2	C	102	PHE	4.8
1	B	110	LEU	4.8
2	D	75	LEU	4.6
1	B	102	LYS	4.6
1	A	114	ILE	4.5
2	C	91	GLU	4.3
1	B	103	VAL	4.3
1	A	135	LYS	4.3
1	A	95	PHE	4.3
1	A	132	PHE	4.3

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Mol	Chain	Res	Type	RSRZ
1	B	76	GLU	4.1
1	A	94	ASN	4.0
2	C	55	LYS	3.9
1	A	118	TYR	3.9
1	B	121	HIS	3.9
1	A	125	ILE	3.8
2	C	67	MET	3.8
1	A	124	ILE	3.8
2	C	63	GLU	3.8
2	D	86	ILE	3.7
1	B	95	PHE	3.7
2	C	106	LYS	3.7
1	A	64	ASP	3.6
1	B	89	HIS	3.6
1	B	81	ILE	3.6
2	C	70	THR	3.5
2	D	93	PHE	3.4
1	A	128	LYS	3.4
1	A	58	LEU	3.3
1	A	129	LEU	3.3
1	A	68	ASP	3.2
2	C	59	ASP	3.2
2	D	99	ILE	3.2
2	C	71	TYR	3.1
1	B	131	GLU	3.1
1	B	125	ILE	3.1
1	A	126	GLN	3.1
1	B	88	ASP	3.1
1	B	91	LEU	3.0
1	B	112	GLU	3.0
1	A	111	GLU	3.0
1	B	82	ASN	3.0
2	C	108	GLU	2.9
2	C	93	PHE	2.9
1	B	99	LEU	2.8
2	C	88	GLU	2.8
1	B	145	GLU	2.8
1	B	118	TYR	2.7
1	B	63	LEU	2.7
1	A	136	MET	2.7
1	A	119	ASN	2.7
1	A	99	LEU	2.7

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Mol	Chain	Res	Type	RSRZ
2	C	99	ILE	2.7
2	D	64	ILE	2.7
1	B	97	ASN	2.6
1	B	113	ARG	2.6
1	A	90	ALA	2.6
2	C	56	ASP	2.6
1	B	80	ASN	2.6
2	D	106	LYS	2.6
2	C	75	LEU	2.6
2	C	103	LEU	2.6
1	B	90	ALA	2.6
1	A	140	SER	2.5
2	C	101	ASN	2.5
2	D	82	ASP	2.5
1	A	139	ILE	2.5
2	D	102	PHE	2.5
1	B	127	GLU	2.5
1	A	121	HIS	2.5
1	B	114	ILE	2.5
1	A	120	ASP	2.4
2	C	87	ASP	2.4
1	A	115	TYR	2.4
2	D	68	LEU	2.4
1	B	136	MET	2.4
1	B	138	LYS	2.4
1	B	133	THR	2.3
2	C	85	TYR	2.3
1	B	64	ASP	2.3
2	D	90	ASP	2.3
2	D	103	LEU	2.3
2	C	100	GLU	2.3
1	B	92	MET	2.2
1	A	108	GLU	2.2
1	B	109	LYS	2.2
2	C	68	LEU	2.2
1	A	59	TYR	2.2
2	C	66	LEU	2.2
1	A	91	LEU	2.1
1	A	110	LEU	2.1
2	D	97	ASN	2.1
2	C	74	LEU	2.1
2	D	84	SER	2.1

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Mol	Chain	Res	Type	RSRZ
2	C	60	VAL	2.0
1	B	105	ASP	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.