



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 01:35 PM UTC

PDB ID : 6Y2X / pdb_00006y2x
Title : RING-DTC domains of Deltex 2, Form 2
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Deposited on : 2020-02-17
Resolution : 1.77 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

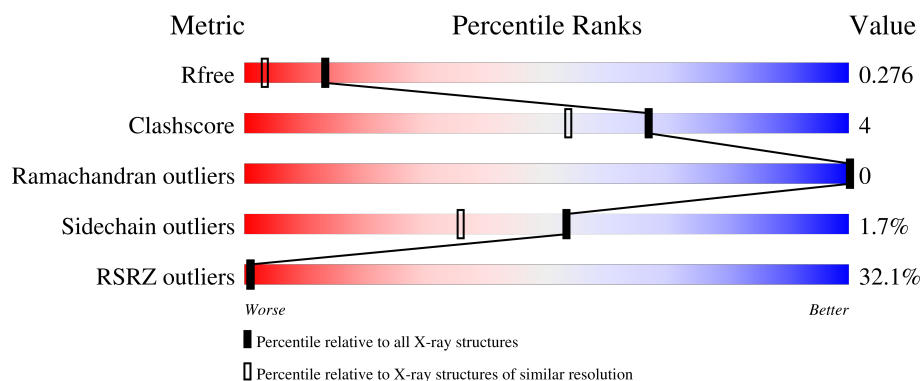
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.77 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	1365 (1.78-1.78)
Clashscore	190562	1395 (1.78-1.78)
Ramachandran outliers	187476	1382 (1.78-1.78)
Sidechain outliers	187428	1382 (1.78-1.78)
RSRZ outliers	180081	1365 (1.78-1.78)

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	235	21% 89% 9% .
1	B	235	35% 68% 7% 25%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 3259 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 Probable E3 ubiquitin-protein ligase DTX2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	231	Total	C	N	O	S	0	3	0
			1755	1095	305	342	13			
1	B	177	Total	C	N	O	S	0	0	0
			1243	776	221	233	13			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	388	GLY	-	expression tag	UNP Q86UW9
A	389	SER	-	expression tag	UNP Q86UW9
B	388	GLY	-	expression tag	UNP Q86UW9
B	389	SER	-	expression tag	UNP Q86UW9

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

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

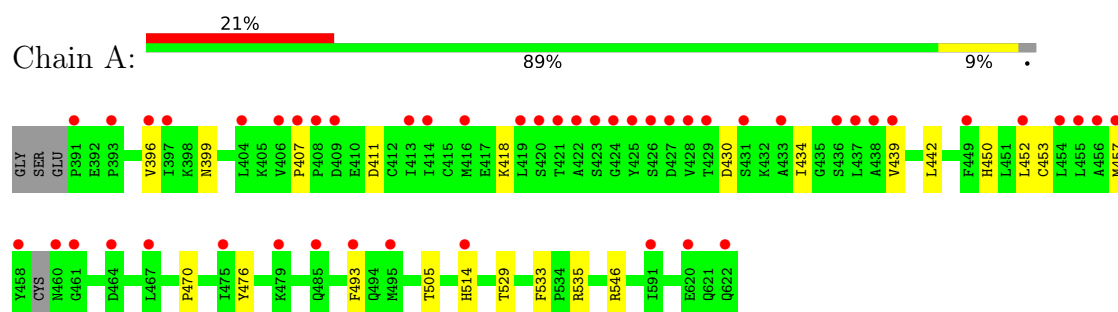
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	209	Total	O	0	0
			209	209		
3	B	48	Total	O	0	0
			48	48		

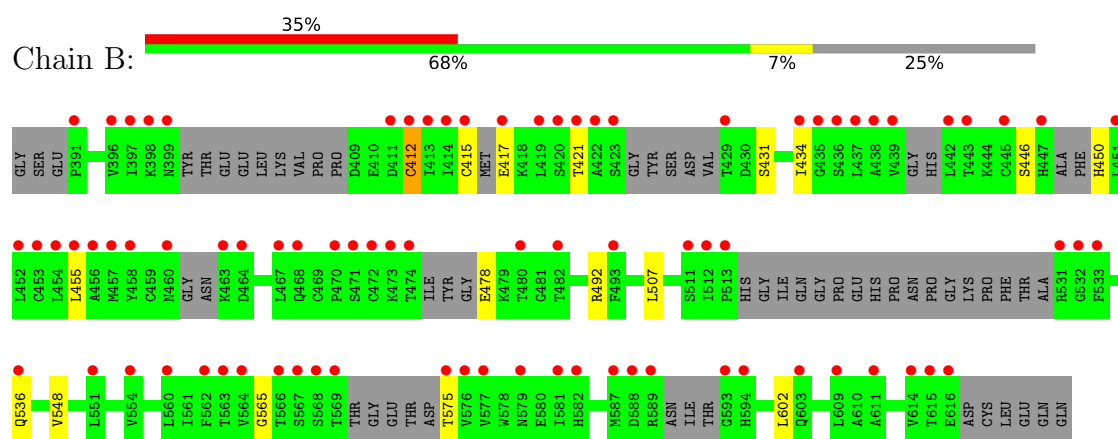
3 Residue-property plots [i](#)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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: Probable E3 ubiquitin-protein ligase DTX2



- Molecule 1: Probable E3 ubiquitin-protein ligase DTX2



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	41.76Å 219.59Å 120.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	60.41 – 1.77 60.41 – 1.77	Depositor EDS
% Data completeness (in resolution range)	98.3 (60.41-1.77) 98.4 (60.41-1.77)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.90 (at 1.77Å)	Xtriage
Refinement program	PHENIX 1.10_2142	Depositor
R, R_{free}	0.242 , 0.274 0.244 , 0.276	Depositor DCC
R_{free} test set	2743 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	28.7	Xtriage
Anisotropy	0.352	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 73.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	3259	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.17% of the height of the origin peak. No significant pseudotranslation is detected.*

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](#)

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	0.32	0/1795	0.51	0/2444
1	B	0.23	0/1258	0.43	0/1700
All	All	0.29	0/3053	0.48	0/4144

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	1755	0	1627	13	0
1	B	1243	0	1097	8	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
3	A	209	0	0	2	0
3	B	48	0	0	0	0
All	All	3259	0	2724	21	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 4.

All (21) 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:412:CYS:SG	1:B:450:HIS:N	2.49	0.85
1:B:421:THR:O	1:B:450:HIS:NE2	2.31	0.64
1:A:411:ASP:HA	1:A:418:LYS:HA	1.83	0.60
1:B:431:SER:OG	1:B:434:ILE:O	2.21	0.56
1:B:434:ILE:HD12	1:B:455:LEU:HD22	1.89	0.54
1:A:514[A]:HIS:CD2	1:A:529:THR:HA	2.44	0.51
1:A:407:PRO:HB3	1:A:439:VAL:HG21	1.93	0.50
1:B:565:GLY:O	1:B:575:THR:N	2.46	0.48
1:A:546:ARG:NH1	3:A:810:HOH:O	2.46	0.47
1:A:450:HIS:HB2	1:A:453:CYS:SG	2.55	0.47
1:A:396:VAL:HA	1:A:399:ASN:HD22	1.80	0.47
1:B:548:VAL:HG21	1:B:602:LEU:HD22	1.97	0.47
1:A:457:MET:HE1	1:A:470:PRO:HB3	1.97	0.46
1:A:533:PHE:CD1	1:A:535:ARG:HG3	2.51	0.45
1:B:415:CYS:O	1:B:417:GLU:N	2.50	0.45
1:A:514[B]:HIS:HD2	3:A:882:HOH:O	2.00	0.44
1:A:396:VAL:HA	1:A:399:ASN:ND2	2.33	0.43
1:A:493:PHE:CE1	1:A:505:THR:HB	2.54	0.42
1:B:507:LEU:HD11	1:B:536:GLN:HG2	2.01	0.42
1:A:442:LEU:HB3	1:A:476:TYR:CZ	2.55	0.41
1:A:434:ILE:HG22	1:A:452:LEU:HG	2.03	0.41

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	230/235 (98%)	225 (98%)	5 (2%)	0	100	100
1	B	155/235 (66%)	147 (95%)	8 (5%)	0	100	100
All	All	385/470 (82%)	372 (97%)	13 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	184/203 (91%)	183 (100%)	1 (0%)	81	73
1	B	116/203 (57%)	112 (97%)	4 (3%)	32	12
All	All	300/406 (74%)	295 (98%)	5 (2%)	53	36

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	430	ASP
1	B	412	CYS
1	B	446	SER
1	B	478	GLU
1	B	492	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	395	GLN
1	A	399	ASN
1	A	579	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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 4 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

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	231/235 (98%)	1.02	49 (21%)	2 2	16, 43, 91, 121	3 (1%)
1	B	177/235 (75%)	2.07	82 (46%)	0 0	27, 76, 102, 118	0
All	All	408/470 (86%)	1.48	131 (32%)	1 1	16, 56, 99, 121	3 (0%)

All (131) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	436	SER	6.1
1	B	396	VAL	5.7
1	B	429	THR	5.5
1	A	419	LEU	5.5
1	B	439	VAL	5.5
1	B	423	SER	5.5
1	A	460	ASN	5.3
1	A	391	PRO	5.2
1	A	437	LEU	4.9
1	B	564	VAL	4.9
1	A	413	ILE	4.7
1	A	452	LEU	4.6
1	B	566	THR	4.5
1	B	460	ASN	4.5
1	B	594	HIS	4.5
1	B	589	ARG	4.5
1	B	611	ALA	4.4
1	B	576	VAL	4.3
1	B	614	VAL	4.1
1	A	431	SER	4.1
1	B	581	ILE	4.1
1	B	452	LEU	4.1
1	A	439	VAL	4.1
1	B	437	LEU	4.0

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Mol	Chain	Res	Type	RSRZ
1	A	428	VAL	4.0
1	B	474	THR	3.9
1	B	569	THR	3.9
1	A	461	GLY	3.9
1	B	422	ALA	3.9
1	A	425	TYR	3.8
1	B	609	LEU	3.8
1	B	399	ASN	3.8
1	B	458	TYR	3.7
1	A	408	PRO	3.7
1	B	593	GLY	3.7
1	B	533	PHE	3.6
1	B	577	VAL	3.6
1	B	413	ILE	3.5
1	B	419	LEU	3.5
1	A	393	PRO	3.5
1	A	420	SER	3.5
1	A	458	TYR	3.5
1	B	579	ASN	3.4
1	B	455	LEU	3.4
1	B	467	LEU	3.4
1	B	464	ASP	3.4
1	B	391	PRO	3.4
1	B	513	PRO	3.4
1	A	475	ILE	3.3
1	B	443	THR	3.3
1	A	422	ALA	3.3
1	A	456	ALA	3.3
1	B	420	SER	3.3
1	A	457	MET	3.2
1	B	411	ASP	3.2
1	B	438	ALA	3.2
1	B	567	SER	3.2
1	A	433	ALA	3.1
1	B	563	THR	3.1
1	A	396	VAL	3.1
1	B	435	GLY	3.1
1	B	397	ILE	3.0
1	B	417	GLU	3.0
1	A	622	GLN	3.0
1	B	451	LEU	3.0
1	B	454	LEU	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	562	PHE	3.0
1	B	414	ILE	3.0
1	B	531	ARG	3.0
1	B	412	CYS	3.0
1	B	453	CYS	2.9
1	B	588	ASP	2.9
1	A	407	PRO	2.8
1	B	551	LEU	2.8
1	A	591	ILE	2.8
1	A	495	MET	2.8
1	A	455	LEU	2.8
1	A	404	LEU	2.7
1	B	472	CYS	2.7
1	B	560	LEU	2.7
1	A	414	ILE	2.7
1	B	587	MET	2.7
1	A	493	PHE	2.7
1	B	512	ILE	2.7
1	A	485	GLN	2.7
1	B	470	PRO	2.7
1	B	568	SER	2.7
1	B	415	CYS	2.7
1	B	442	LEU	2.7
1	A	424	GLY	2.7
1	B	421	THR	2.6
1	A	406	VAL	2.6
1	A	479	LYS	2.6
1	B	463	LYS	2.6
1	A	467	LEU	2.6
1	B	447	HIS	2.6
1	A	426	SER	2.6
1	A	514[A]	HIS	2.6
1	A	409	ASP	2.5
1	A	416	MET	2.5
1	B	493	PHE	2.5
1	B	456	ALA	2.5
1	B	434	ILE	2.5
1	B	473	LYS	2.5
1	A	454	LEU	2.4
1	A	438	ALA	2.4
1	A	397	ILE	2.4
1	A	423	SER	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	554	VAL	2.4
1	B	575	THR	2.4
1	B	482	THR	2.3
1	B	471	SER	2.3
1	A	429	THR	2.3
1	B	582	HIS	2.3
1	A	620[A]	GLU	2.3
1	B	398	LYS	2.2
1	B	457	MET	2.2
1	B	445	CYS	2.2
1	A	421	THR	2.2
1	B	511	SER	2.1
1	B	480	THR	2.1
1	B	532	GLY	2.1
1	B	468	GLN	2.1
1	B	615	THR	2.1
1	A	449	PHE	2.1
1	A	427	ASP	2.0
1	A	464	ASP	2.0
1	A	436	SER	2.0
1	B	616	GLU	2.0
1	B	536	GLN	2.0
1	B	603	GLN	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](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	ZN	A	701	1/1	0.93	0.08	66,66,66,66	0
2	ZN	B	702	1/1	0.94	0.08	94,94,94,94	0
2	ZN	B	701	1/1	0.97	0.06	86,86,86,86	0
2	ZN	A	702	1/1	0.98	0.06	46,46,46,46	0

6.5 Other polymers [i](#)

There are no such residues in this entry.