wwPDB X-ray Structure Validation Summary Report (i)

Aug 16, 2023 – 10:48 AM EDT

PDB ID	:	1ZM4
Title	:	Structure of the eEF2-ETA-bTAD complex
Authors	:	Joergensen, R.; Merrill, A.R.; Yates, S.P.; Marquez, V.E.; Schwan, A.L.; Boesen, T.; Andersen, G.R.
Deposited on	:	2005-05-10
Resolution	:	2.90 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.90 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.
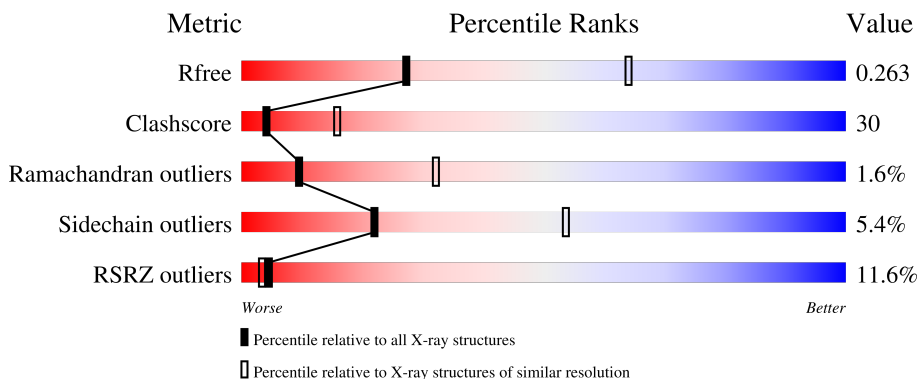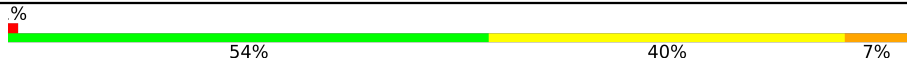

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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 <=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	842	
1	C	842	
1	E	842	
2	B	207	
2	D	207	

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Mol	Chain	Length	Quality of chain
2	F	207	% 54% 40% 7%

2   Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 24125 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 Elongation factor 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	823	Total	C	N	O	S	0	0	0
			6405	4075	1093	1207	30			
1	C	823	Total	C	N	O	S	0	0	0
			6415	4082	1095	1208	30			
1	E	823	Total	C	N	O	S	0	0	0
			6415	4082	1095	1208	30			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	699	DDE	HIS	modified residue	UNP P32324
C	699	DDE	HIS	modified residue	UNP P32324
E	699	DDE	HIS	modified residue	UNP P32324

- Molecule 2 is a protein called exotoxin A.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	207	Total	C	N	O	0	0	0
			1587	1001	283	303			
2	D	207	Total	C	N	O	0	0	0
			1587	1001	283	303			
2	F	207	Total	C	N	O	0	0	0
			1587	1001	283	303			

- Molecule 3 is BETA-METHYLENE-THIAZOLE-4-CARBOXYAMIDE-ADENINE DINUCLEOTIDE (three-letter code: TAD) (formula: $C_{20}H_{27}N_7O_{13}P_2S$).
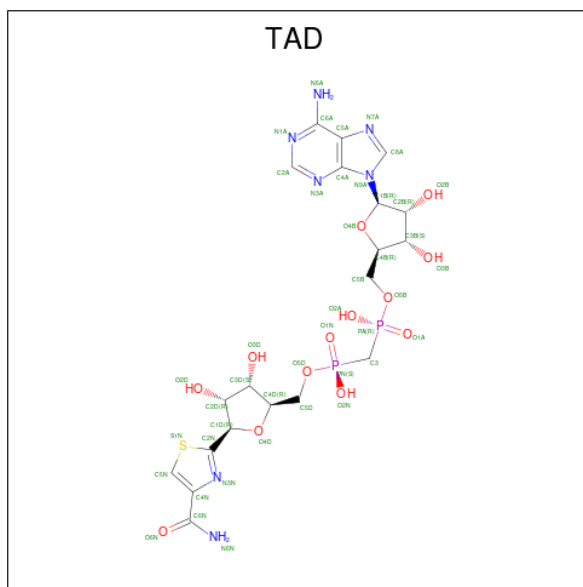
TAD

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	B	1	Total	C	N	O	P	S	0	0
			43	20	7	13	2	1		
3	D	1	Total	C	N	O	P	S	0	0
			43	20	7	13	2	1		
3	F	1	Total	C	N	O	P	S	0	0
			43	20	7	13	2	1		

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 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: Elongation factor 2

F766 V774 N775 E783 L784 R785 T788 A792 F793 P794 Q795 M796 V797 F798 D799 S806 L809 D810 P811 R823 E831 V832 P833 G834 W835 Q836 E837 Y838 L842

• Molecule 1: Elongation factor 2

Chain C:

A230 K231 K232 F233 G234 V235 D236 K237 A238 K239 M240 M241 L244 F249 F250 N251 P252 K253 T254 K255 K256 W257 T258 N259 K260 D261 T262 E265 G266 K267 P268 L269 E270 F273 N274 M275 F276 I277 L278 D279 P280 R283 L284 F285 I288 F291 K292 K293 D294 E295 I296 P297

V298 L299 L300 E301 K302 L303 E304 I305 V306 L307 K308 G309 D310 E311 K312 D313 L314 E315 G316 L319 L320 K321 V322 V323 M324 R325 K326 F327 L328 P329 A330 A331 L335 E336 M337 I338 I339 L340 H341 L342 P343 S344 P345 V346 T347 A348 Y351 R352 A353 E354 Q355 L356 Y357 P360 A361 D362

D363 A364 N365 C366 I369 K370 N371 C372 D373 P374 M379 L380 Y381 V386 P387 T388 S389 D390 K391 G392 R393 F394 Y395 A396 F397 G398 R399 V400 F401 A402 G403 T404 V405 K406 K410 V411 R412 I413 Q414 Y418 G421 D424 D425 L426 F427 I428 K429 A430 I431 Q432 R433 L436
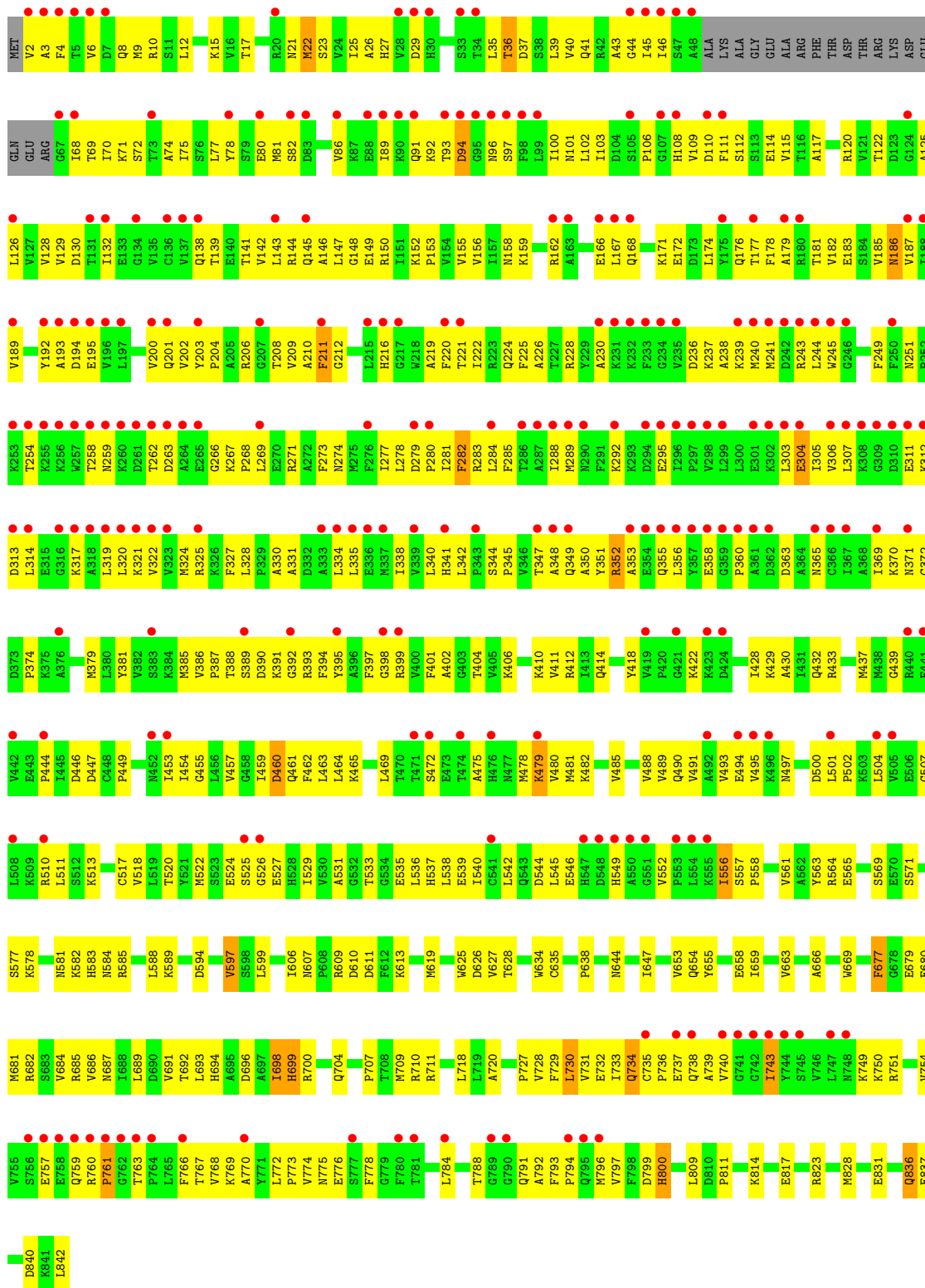
M437 M438 G439 R440 F441 V442 I445 D446 D447 C448 P449 I453 I454 G455 L456 V457 G458 I459 D460 Q461 F462 L463 L464 K465 T466 G467 S472 A475 M478 K479 V480 M481 F482 F483 S484 V485 V489 Q490 V491 A492 V493 E494 V495 K496 N497 A498 N499 D500 L501 P502 K503 L504 V505 E506

G507 L508 K509 R510 K513 S514 D515 P516 T520 Y521 M522 S523 E524 S525 G526 E527 H528 I529 V530 A531 G532 T533 L536 H537 L538 E539 I540 C541 L542 Q543 D544 L645 E546 H547 D648 H649 A550 G551 P553 L554 K555 I556 Y563 R564 E565 S569 L576 S577 K578 N581 K582 H583

N584 R585 I586 Y587 L588 K589 A590 E591 D594 E595 E596 V597 S598 L599 A600 I601 I606 D611 F612 K613 A614 R615 M619 D626 V627 T628 I633 W634 C635 P638 N644 I647 K651 Q655 Y655 L656 I659 V663 A666 K672 I676 F677 G678 E679

E680 M681 R682 S683 V684 R685 V686 N687 I688 L689 T692 L693 H694 A695 D696 A697 I698 H699 R700 G703 Q704 I705 I706 M709 R710 R711 L718 L719 A720 D721 P722 P727 V728 F729 L730 I733 Q734 C735 P736 E737 Q738 A739 V740 G741 G742 I743 Y744 S745 N748 K749 K750 R751

E757 E758 Q759 R760 P761 G762 T763 F766 T767 V768 Y771 L772 P773 V774 N775 E776 T781 T788 L784 R785 T788 G789 G790 Q791 A792 F793 P794 V797 F798 D799 H800 P811 G816 L820 K824 M828 E831 Q836 D840 K841 L842

• Molecule 1: Elongation factor 2

Chain E:

● Molecule 2: exotoxin A

Chain B:

E399 D403 G404 G405 S410 T411 R412 G413 W417 E420 R421 L422 L423 R427 E431 R432 G433 Y439 H440 G441 T442 F443 I450 G454 V455 R456 A457 R458 S459 Q460 D461 A464 I465 W466 R467 Y470 I471 A472 G473 D474 P475 Y479 A482 Q483 D484 Q485 E486

P487 D488 A489 R490 G491 R492 I493 R494 N495 G496 A497 L498 V501 Y502 V503 P504 R505 L508 P509 Y512 R513 T517 L518 P521 E522 A523 A524 E528 R529 L530 L535 P536 L537 R538 D540 A541 I542 P545 E546 E547 E548 L552 E553 T554 W558 P559 L560 A561 E562

R563 T564 P568 I571 L582 D583 P584 K590 L597 S602 Q603 P604 G605

• Molecule 2: exotoxin A

Chain D:

60% 37% •

E399 F400 L401 G402 D403 G404 G405 S410 T411 R412 G413 W417 T418 V419 L422 L423 R427 Q428 L429 E430 E431 R432 F443 L444 E445 A446 A447 I450 V451 F452 G453 R456 A457 R458 S459 Q460 D461 L462 D463 A464 I465 Y470 I471 A472 G473 D484 Q485 E486 P487 D488 A489

R490 G491 R492 I493 R494 L499 V503 P504 R505 L508 R513 L518 A519 A520 A523 V527 E528 R529 L530 I531 G532 H533 L535 P536 L537 R538 I542 E546 E547 R551 L552 E553 T554 W558 P559 L560 A561 T564 V565 V566 I567 P568 R576 N577 D583

P584 L597 S602 Q603 P604 G605

• Molecule 2: exotoxin A

Chain F:

54% 40% 7%

E399 F400 L401 G402 D403 G404 G405 F409 S410 T411 R412 G413 W417 T418 V419 E420 R421 L422 L423 H426 R427 Q428 L429 E430 E431 R432 G433 Y439 H440 L444 E445 I450 V451 G454 V455 R456 A457 R458 S459 A464 I465 W466 R467 Y470 I471 A472 G473 Y479 D484

P487 D488 A489 R490 G491 R492 I493 R494 L498 L499 R500 V501 Y502 R505 L508 P509 R513 L516 T517 L518 A519 A520 P521 E522 A523 A524 E528 R529 L530 I531 G532 H533 P534 L535 P536 L537 R538 P545 E546 E547 L552 E553 T554 I555 W558 P559 L560 A561 E562 R563

V566 I567 P568 S569 A570 I571 R576 N577 V578 L582 D583 P584 I587 K590 E591 I594 L597 P604 G605

4   Data and refinement statistics   (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants	326.95Å 68.58Å 190.20Å	Depositor
a, b, c, α, β, γ	90.00° 103.42° 90.00°	
Resolution (Å)	30.00 – 2.90	Depositor
	29.97 – 2.90	EDS
% Data completeness	(Not available) (30.00-2.90)	Depositor
(in resolution range)	99.8 (29.97-2.90)	EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	3.99 (at 2.90Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.246 , 0.276	Depositor
	0.238 , 0.263	DCC
R_{free} test set	1851 reflections (2.02%)	wwPDB-VP
Wilson B-factor (Å^2)	41.3	Xtriage
Anisotropy	0.402	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 49.9	EDS
L-test for twinning[2]	$< |L| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	24125	wwPDB-VP
Average B, all atoms (Å^2)	52.0	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 45.77 % 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 1.2606e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: TAD, DDE

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	0.42	0/6517	0.66	1/8823 (0.0%)
1	C	0.42	0/6517	0.66	2/8823 (0.0%)
1	E	0.41	0/6517	0.62	0/8823
2	B	0.58	0/1626	0.82	0/2216
2	D	0.57	0/1626	0.80	0/2216
2	F	0.57	0/1626	0.83	0/2216
All	All	0.45	0/24429	0.69	3/33117 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	820	LEU	CA-CB-CG	6.18	129.51	115.30
1	A	236	ASP	N-CA-C	-5.56	95.98	111.00
1	C	711	ARG	NE-CZ-NH2	-5.05	117.77	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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	6405	0	6472	394	1
1	C	6415	0	6488	407	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	6415	0	6488	425	0
2	B	1587	0	1539	75	0
2	D	1587	0	1539	75	0
2	F	1587	0	1539	83	1
3	B	43	0	25	2	0
3	D	43	0	25	2	0
3	F	43	0	25	3	0
All	All	24125	0	24140	1434	1

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 30.

The worst 5 of 1434 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)
2:B:552:LEU:HD12	2:B:552:LEU:H	1.10	1.15
1:E:71:LYS:HE3	1:E:387:PRO:HD2	1.32	1.11
1:E:556:ILE:HG22	1:E:557:SER:H	1.08	1.09
1:E:699:DDE:HAC2	1:E:699:DDE:HAD2	1.12	1.08
1:C:699:DDE:HAD2	1:C:699:DDE:HAC2	1.09	1.08

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:690:ASP:OD2	2:F:563:ARG:NH2[2_556]	2.18	0.02

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	818/842 (97%)	736 (90%)	69 (8%)	13 (2%)	9	32
1	C	818/842 (97%)	727 (89%)	78 (10%)	13 (2%)	9	32
1	E	818/842 (97%)	719 (88%)	89 (11%)	10 (1%)	13	40
2	B	205/207 (99%)	188 (92%)	14 (7%)	3 (2%)	10	34
2	D	205/207 (99%)	185 (90%)	15 (7%)	5 (2%)	6	22
2	F	205/207 (99%)	181 (88%)	18 (9%)	6 (3%)	4	18
All	All	3069/3147 (98%)	2736 (89%)	283 (9%)	50 (2%)	9	32

5 of 50 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	518	LEU
2	D	519	ALA
1	A	112	SER
1	A	479	LYS
1	A	498	ALA

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	699/714 (98%)	668 (96%)	31 (4%)	28	61
1	C	699/714 (98%)	661 (95%)	38 (5%)	22	54
1	E	699/714 (98%)	666 (95%)	33 (5%)	26	59
2	B	161/162 (99%)	148 (92%)	13 (8%)	11	33
2	D	161/162 (99%)	149 (92%)	12 (8%)	13	37
2	F	161/162 (99%)	148 (92%)	13 (8%)	11	33
All	All	2580/2628 (98%)	2440 (95%)	140 (5%)	22	54

5 of 140 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	627	VAL

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Mol	Chain	Res	Type
1	E	718	LEU
2	F	458	ARG
1	C	83	ASP
1	C	81	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 73 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	547	HIS
2	F	448	GLN
1	E	583	HIS
1	E	738	GLN
1	C	168	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

3 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
1	DDE	C	699	1	14,20,21	1.07	1 (7%)	14,28,30	1.78	4 (28%)
1	DDE	A	699	1	5,10,21	0.66	0	3,12,30	1.34	1 (33%)
1	DDE	E	699	1	14,20,21	1.08	1 (7%)	14,28,30	1.78	4 (28%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	DDE	C	699	1	-	8/20/21/23	0/1/1/1
1	DDE	A	699	1	-	1/5/6/23	0/1/1/1
1	DDE	E	699	1	-	8/20/21/23	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	699	DDE	CAT-CE1	3.03	1.54	1.50
1	C	699	DDE	CAT-CE1	2.94	1.54	1.50

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	699	DDE	OAG-CBI-CBW	-3.72	115.78	120.49
1	C	699	DDE	OAG-CBI-CBW	-3.68	115.83	120.49
1	C	699	DDE	CAU-CBW-CBI	-3.12	105.01	111.20
1	E	699	DDE	CAU-CBW-CBI	-3.08	105.08	111.20
1	C	699	DDE	OAG-CBI-NAD	2.86	127.97	123.00

There are no chirality outliers.

5 of 17 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	699	DDE	O-C-CA-CB
1	C	699	DDE	CBI-CBW-NCB-CAC
1	C	699	DDE	CBI-CBW-NCB-CAA
1	C	699	DDE	CAU-CBW-NCB-CAB
1	C	699	DDE	CAU-CBW-NCB-CAC

There are no ring outliers.

3 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	699	DDE	5	0
1	A	699	DDE	1	0
1	E	699	DDE	6	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
3	TAD	F	702	-	40,47,47	1.21	4 (10%)	40,72,72	1.95	10 (25%)
3	TAD	D	701	-	40,47,47	1.19	4 (10%)	40,72,72	1.93	10 (25%)
3	TAD	B	700	-	40,47,47	1.19	4 (10%)	40,72,72	1.97	10 (25%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	TAD	F	702	-	-	3/18/62/62	0/5/5/5
3	TAD	D	701	-	-	3/18/62/62	0/5/5/5
3	TAD	B	700	-	-	3/18/62/62	0/5/5/5

The worst 5 of 12 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	700	TAD	PN-O2N	-3.46	1.48	1.56
3	D	701	TAD	PN-O2N	-3.43	1.48	1.56
3	F	702	TAD	PN-O2N	-3.42	1.48	1.56
3	B	700	TAD	PA-O2A	-3.42	1.48	1.56
3	F	702	TAD	PA-O2A	-3.37	1.48	1.56

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	702	TAD	C4D-O4D-C1D	-5.58	102.54	109.42
3	B	700	TAD	C4D-O4D-C1D	-5.56	102.57	109.42
3	B	700	TAD	N3A-C2A-N1A	-5.45	120.16	128.68
3	D	701	TAD	C4D-O4D-C1D	-5.45	102.70	109.42

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	701	TAD	N3A-C2A-N1A	-5.25	120.47	128.68

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	700	TAD	C5B-O5B-PA-O1A
3	B	700	TAD	PN-C3-PA-O1A
3	D	701	TAD	C5B-O5B-PA-O1A
3	D	701	TAD	PN-C3-PA-O1A
3	F	702	TAD	C5B-O5B-PA-O1A

There are no ring outliers.

3 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	F	702	TAD	3	0
3	D	701	TAD	2	0
3	B	700	TAD	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand TAD F 702

Bond lengths

Bond angles

Torsions

Rings

Ligand TAD D 701

Bond lengths

Bond angles

Torsions

Rings

Ligand TAD B 700

Bond lengths

Bond angles

Torsions

Rings
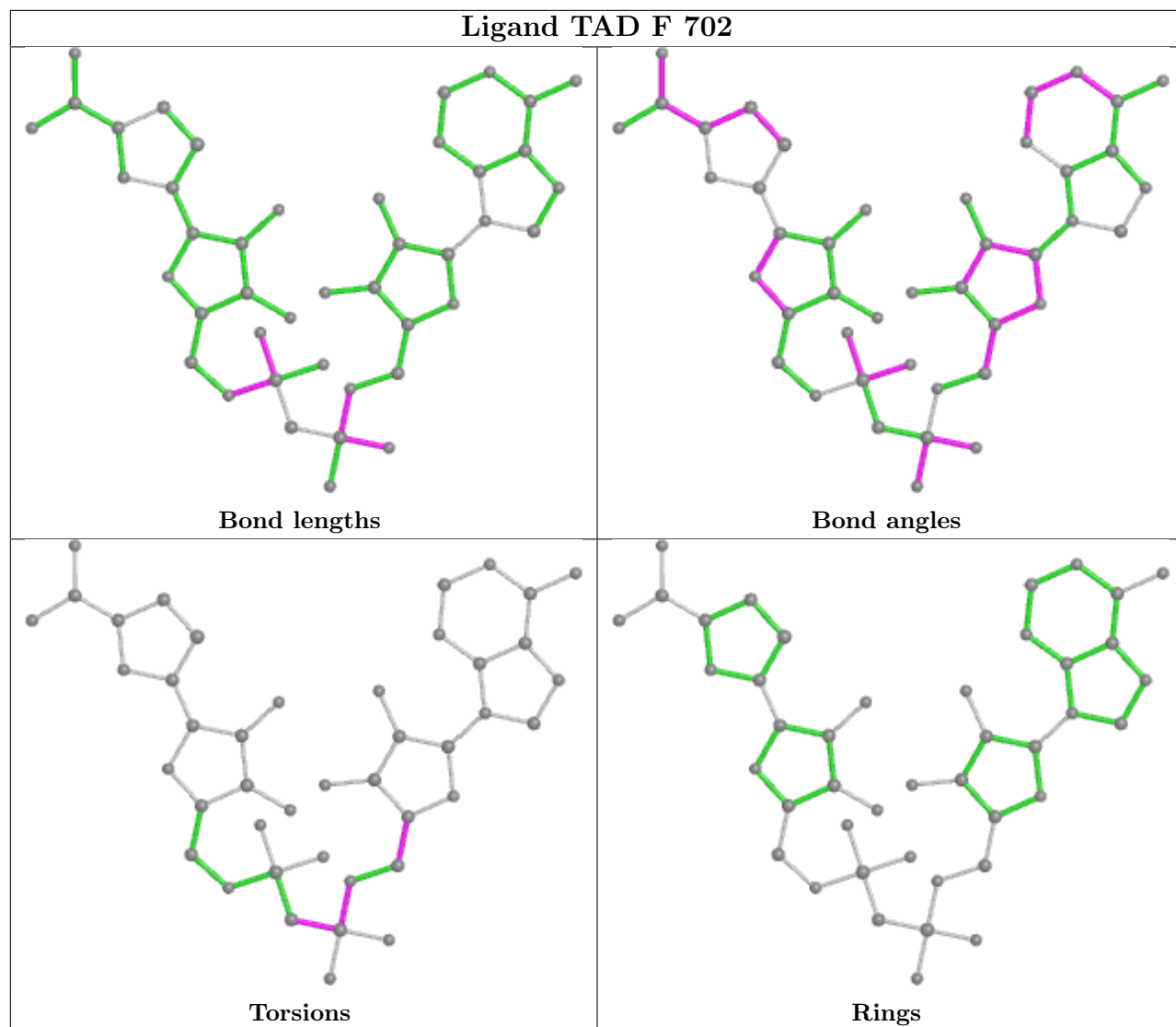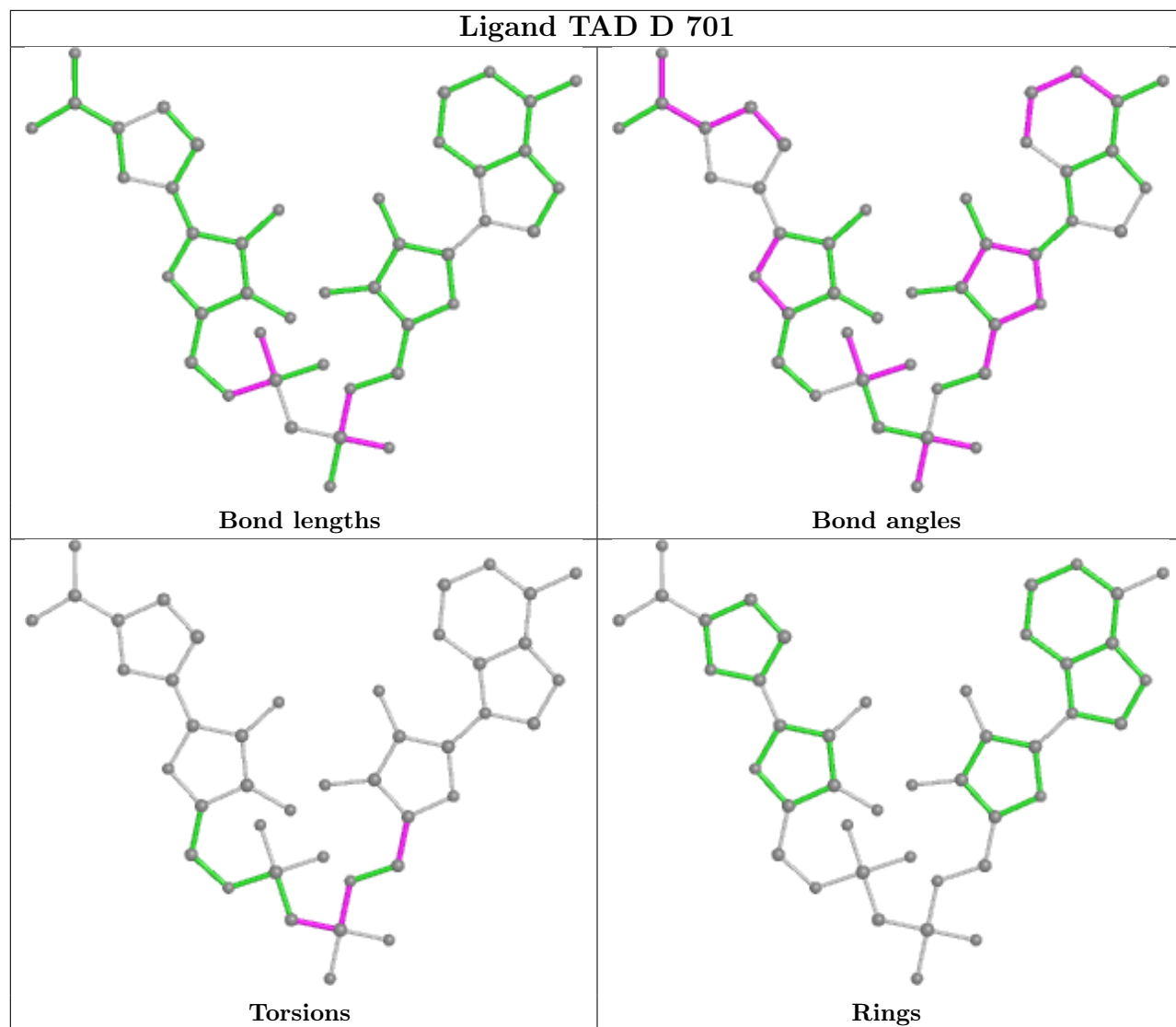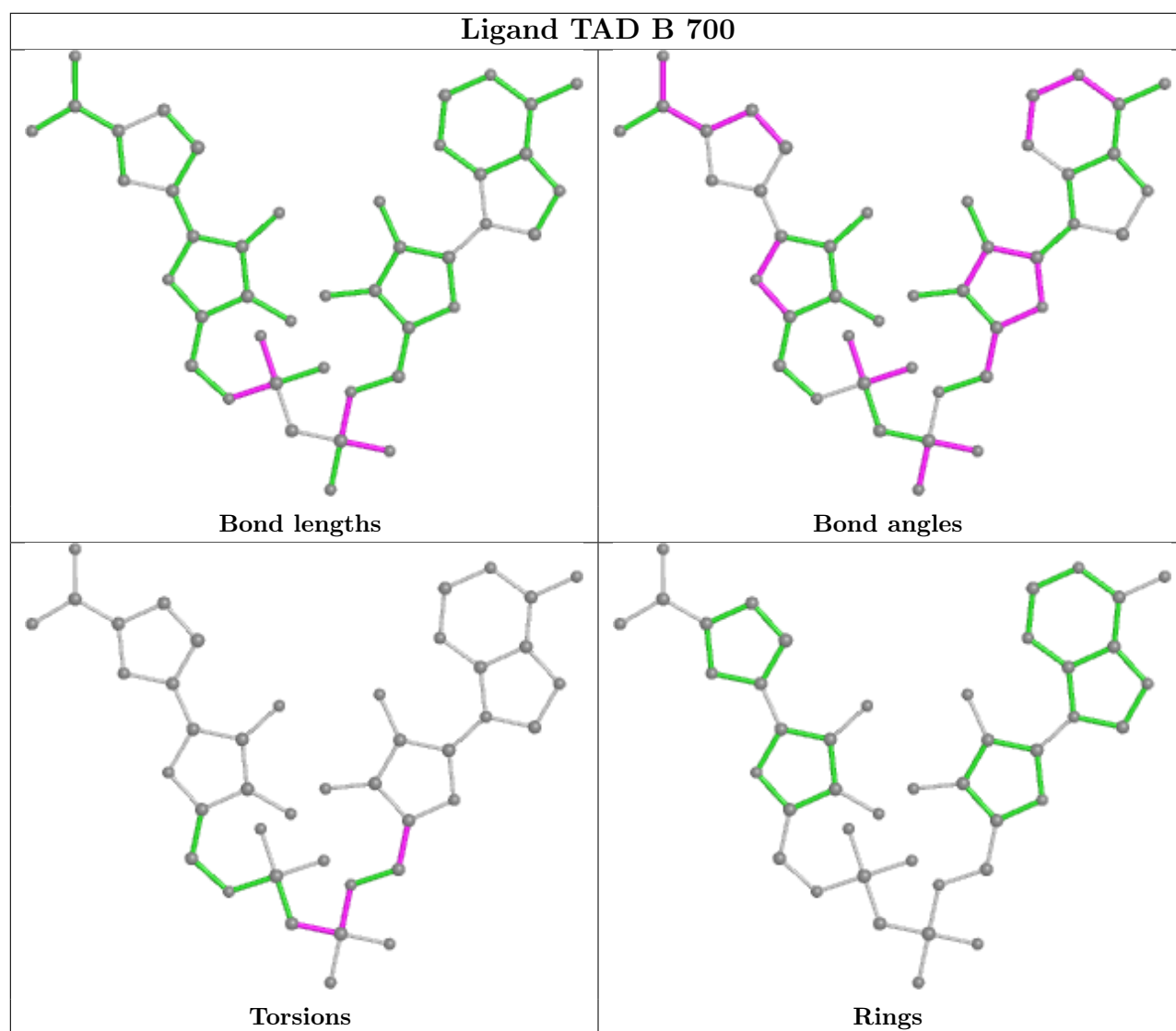
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	822/842 (97%)	0.07	22 (2%)	54	50	8, 46, 77, 106	0
1	C	822/842 (97%)	0.44	85 (10%)	6	5	6, 56, 106, 121	0
1	E	822/842 (97%)	1.27	245 (29%)	0	0	6, 83, 108, 127	0
2	B	207/207 (100%)	-0.43	1 (0%)	91	91	2, 16, 53, 71	0
2	D	207/207 (100%)	-0.39	2 (0%)	82	82	3, 17, 53, 67	0
2	F	207/207 (100%)	-0.34	2 (0%)	82	82	3, 20, 53, 68	0
All	All	3087/3147 (98%)	0.40	357 (11%)	4	3	2, 50, 102, 127	0

The worst 5 of 357 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	554	LEU	8.3
1	E	258	THR	7.9
1	E	256	LYS	7.2
1	E	254	THR	7.0
1	E	257	TRP	6.7

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	DDE	E	699	20/21	0.91	0.22	27,53,81,82	0
1	DDE	C	699	20/21	0.93	0.21	27,53,81,82	0
1	DDE	A	699	10/21	0.94	0.13	40,48,58,58	0

6.3   Carbohydrates (i)
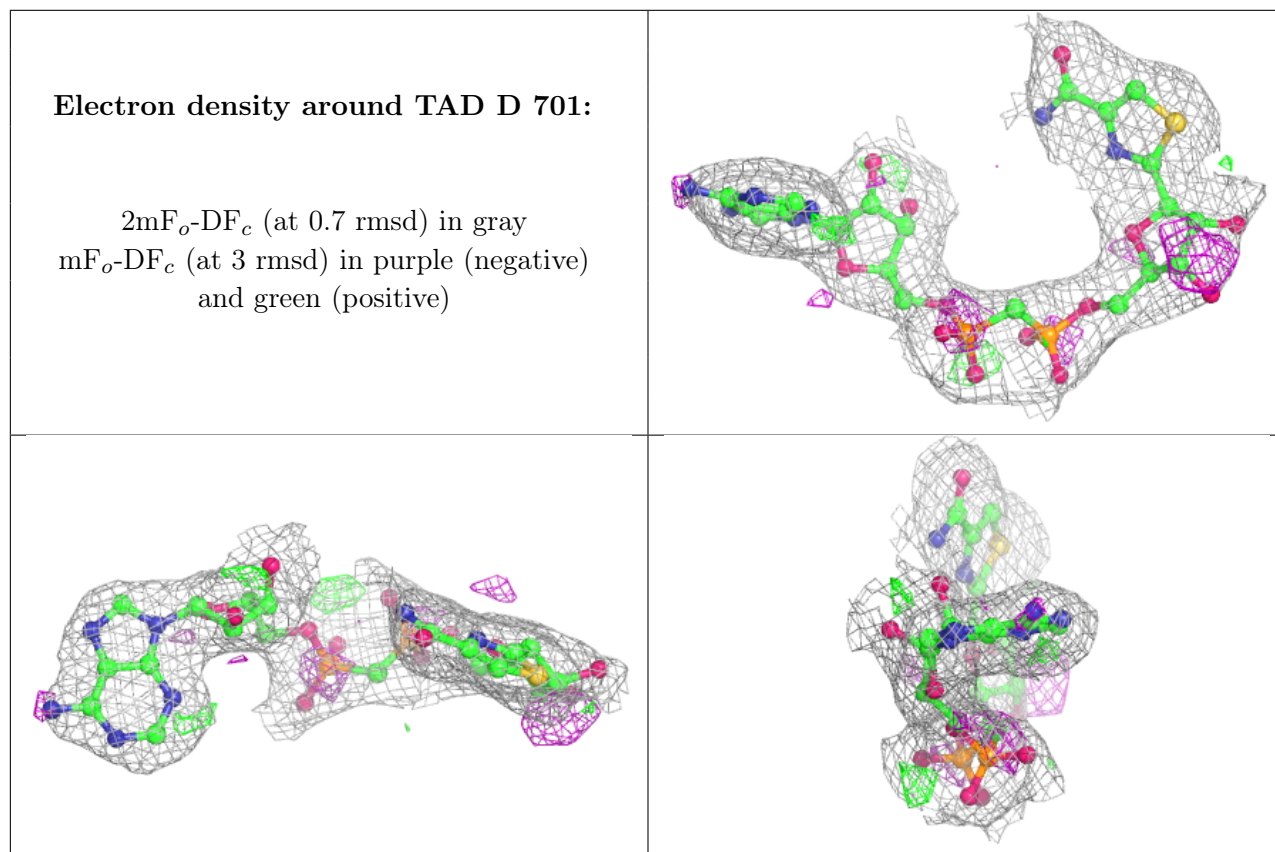
There are no monosaccharides in this entry.

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.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	TAD	D	701	43/43	0.90	0.19	20,31,44,46	0
3	TAD	B	700	43/43	0.91	0.18	23,32,44,47	0
3	TAD	F	702	43/43	0.91	0.18	27,37,49,51	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.
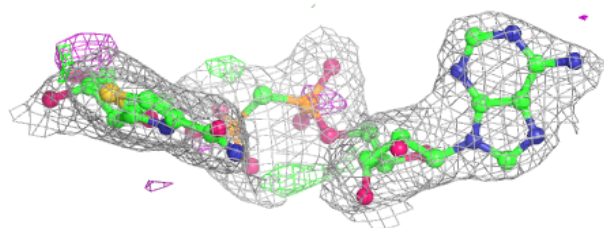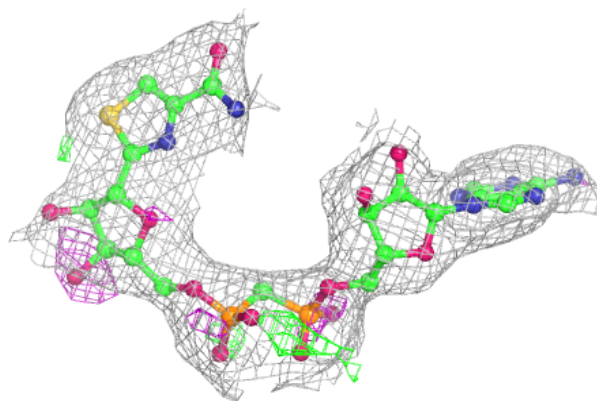

Electron density around TAD D 701:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)

Electron density around TAD B 700:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
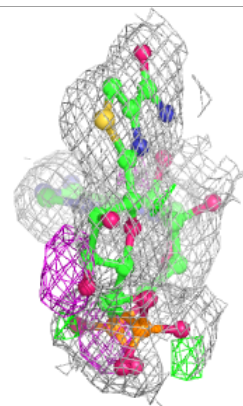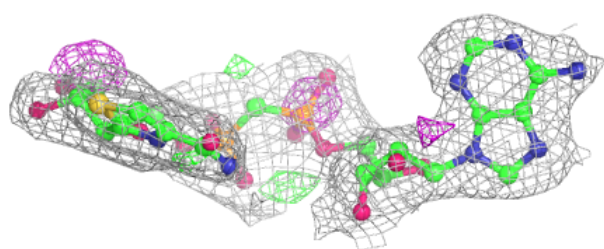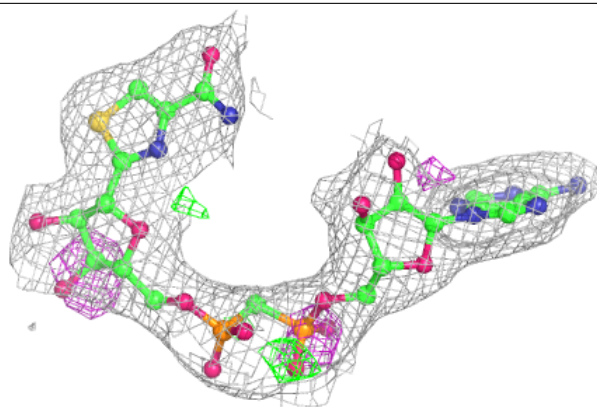
Electron density around TAD F 702:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

6.5 Other polymers (i)

There are no such residues in this entry.