



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 26, 2024 – 05:58 pm BST

PDB ID : 8RD5
Title : Crystal structure of Kemp Eliminase HG3.R5 with bound transition state analog 6-nitrobenzotriazole
Authors : Schaub, D.; Schwander, T.; Hueppi, S.; Buller, R.M.
Deposited on : 2023-12-07
Resolution : 1.50 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

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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.002 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.38.2

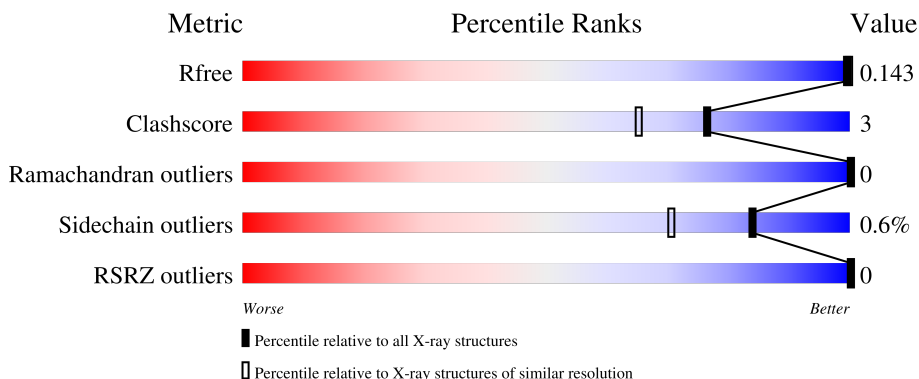
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.50 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))
R_{free}	164625	3717 (1.50-1.50)
Clashscore	180529	4048 (1.50-1.50)
Ramachandran outliers	177936	3970 (1.50-1.50)
Sidechain outliers	177891	3967 (1.50-1.50)
RSRZ outliers	164620	3718 (1.50-1.50)

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	318	 90% • 6%
1	B	318	 88% 6% • 6%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 10071 atoms, of which 4740 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 Endo-1,4-beta-xylanase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	300	4711	1497	2333	409	460	12	56	13	0
1	B	300	4716	1496	2340	411	457	12	58	13	0

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	initiating methionine	UNP P23360
A	0	ALA	-	expression tag	UNP P23360
A	1	GLU	GLN	engineered mutation	UNP P23360
A	10	MET	ILE	engineered mutation	UNP P23360
A	42	MET	GLN	engineered mutation	UNP P23360
A	44	TRP	THR	engineered mutation	UNP P23360
A	49	LEU	MET	engineered mutation	UNP P23360
A	50	GLN	LYS	engineered mutation	UNP P23360
A	54	VAL	THR	engineered mutation	UNP P23360
A	69	VAL	LEU	engineered mutation	UNP P23360
A	81	GLY	ARG	engineered mutation	UNP P23360
A	83	GLY	HIS	engineered mutation	UNP P23360
A	84	MET	THR	engineered mutation	UNP P23360
A	90	HIS	GLN	engineered mutation	UNP P23360
A	102	GLU	ASN	engineered mutation	UNP P23360
A	125	VAL	ALA	engineered mutation	UNP P23360
A	130	GLY	ASN	engineered mutation	UNP P23360
A	131	SER	GLU	engineered mutation	UNP P23360
A	154	LYS	PRO	engineered mutation	UNP P23360
A	172	ALA	ASN	engineered mutation	UNP P23360
A	174	SER	TYR	engineered mutation	UNP P23360
A	190	LYS	ARG	engineered mutation	UNP P23360
A	207	MET	GLN	engineered mutation	UNP P23360
A	209	ASN	HIS	engineered mutation	UNP P23360
A	234	SER	ALA	engineered mutation	UNP P23360

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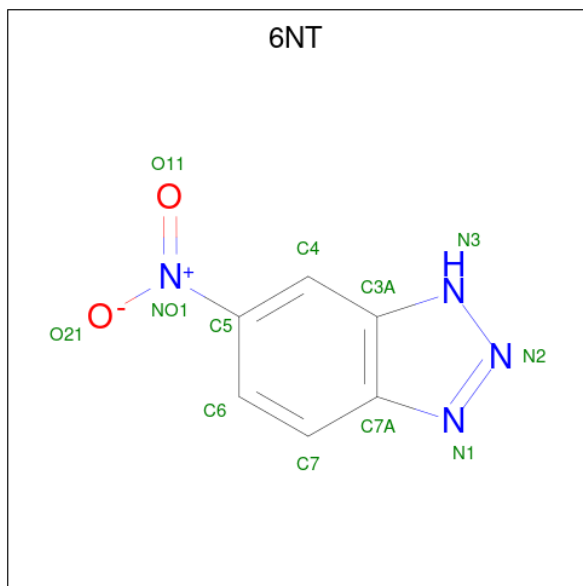
Chain	Residue	Modelled	Actual	Comment	Reference
A	236	LEU	THR	engineered mutation	UNP P23360
A	237	MET	GLU	engineered mutation	UNP P23360
A	266	SER	VAL	engineered mutation	UNP P23360
A	267	PHE	TRP	engineered mutation	UNP P23360
A	304	GLY	-	expression tag	UNP P23360
A	305	SER	-	expression tag	UNP P23360
A	306	ILE	-	expression tag	UNP P23360
A	307	GLU	-	expression tag	UNP P23360
A	308	GLY	-	expression tag	UNP P23360
A	309	ARG	-	expression tag	UNP P23360
A	310	GLY	-	expression tag	UNP P23360
A	311	HIS	-	expression tag	UNP P23360
A	312	HIS	-	expression tag	UNP P23360
A	313	HIS	-	expression tag	UNP P23360
A	314	HIS	-	expression tag	UNP P23360
A	315	HIS	-	expression tag	UNP P23360
A	316	HIS	-	expression tag	UNP P23360
B	-1	MET	-	initiating methionine	UNP P23360
B	0	ALA	-	expression tag	UNP P23360
B	1	GLU	GLN	engineered mutation	UNP P23360
B	10	MET	ILE	engineered mutation	UNP P23360
B	42	MET	GLN	engineered mutation	UNP P23360
B	44	TRP	THR	engineered mutation	UNP P23360
B	49	LEU	MET	engineered mutation	UNP P23360
B	50	GLN	LYS	engineered mutation	UNP P23360
B	54	VAL	THR	engineered mutation	UNP P23360
B	69	VAL	LEU	engineered mutation	UNP P23360
B	81	GLY	ARG	engineered mutation	UNP P23360
B	83	GLY	HIS	engineered mutation	UNP P23360
B	84	MET	THR	engineered mutation	UNP P23360
B	90	HIS	GLN	engineered mutation	UNP P23360
B	102	GLU	ASN	engineered mutation	UNP P23360
B	125	VAL	ALA	engineered mutation	UNP P23360
B	130	GLY	ASN	engineered mutation	UNP P23360
B	131	SER	GLU	engineered mutation	UNP P23360
B	154	LYS	PRO	engineered mutation	UNP P23360
B	172	ALA	ASN	engineered mutation	UNP P23360
B	174	SER	TYR	engineered mutation	UNP P23360
B	190	LYS	ARG	engineered mutation	UNP P23360
B	207	MET	GLN	engineered mutation	UNP P23360
B	209	ASN	HIS	engineered mutation	UNP P23360
B	234	SER	ALA	engineered mutation	UNP P23360

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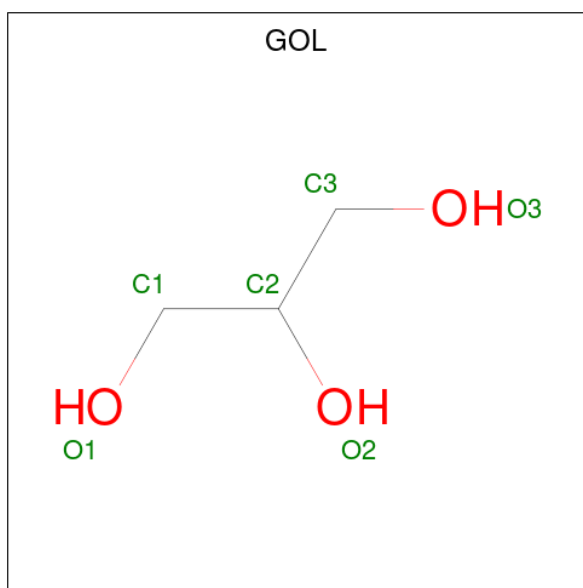
Chain	Residue	Modelled	Actual	Comment	Reference
B	236	LEU	THR	engineered mutation	UNP P23360
B	237	MET	GLU	engineered mutation	UNP P23360
B	266	SER	VAL	engineered mutation	UNP P23360
B	267	PHE	TRP	engineered mutation	UNP P23360
B	304	GLY	-	expression tag	UNP P23360
B	305	SER	-	expression tag	UNP P23360
B	306	ILE	-	expression tag	UNP P23360
B	307	GLU	-	expression tag	UNP P23360
B	308	GLY	-	expression tag	UNP P23360
B	309	ARG	-	expression tag	UNP P23360
B	310	GLY	-	expression tag	UNP P23360
B	311	HIS	-	expression tag	UNP P23360
B	312	HIS	-	expression tag	UNP P23360
B	313	HIS	-	expression tag	UNP P23360
B	314	HIS	-	expression tag	UNP P23360
B	315	HIS	-	expression tag	UNP P23360
B	316	HIS	-	expression tag	UNP P23360

- Molecule 2 is 6-NITROBENZOTRIAZOLE (three-letter code: 6NT) (formula: $C_6H_4N_4O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			
2	A	1	Total	16	6	4	4	2	0	0
2	B	1	Total	16	6	4	4	2	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	A	1	14	3	8	3	2	0
3	A	1	14	3	8	3	2	0
3	A	1	14	3	8	3	2	0
3	A	1	14	3	8	3	2	0
3	B	1	14	3	8	3	2	0
3	B	1	14	3	8	3	2	0
3	B	1	14	3	8	3	2	0

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	B	1	7	2	3	2	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	A	266	266	266	0	0
5	B	241	241	241	0	0

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: Endo-1,4-beta-xylanase

Chain A:  90% • 6%



- Molecule 1: Endo-1,4-beta-xylanase

Chain B:  88% • 6% • 6%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	44.41Å 50.07Å 65.58Å 100.72° 102.70° 99.30°	Depositor
Resolution (Å)	43.20 – 1.50 43.20 – 1.50	Depositor EDS
% Data completeness (in resolution range)	96.4 (43.20-1.50) 93.6 (43.20-1.50)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.65 (at 1.50Å)	Xtrriage
Refinement program	REFMAC 5.8.0419, REFMAC 5.8.0419	Depositor
R, R_{free}	0.103 , 0.142 0.102 , 0.143	Depositor DCC
R_{free} test set	4133 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	7.1	Xtrriage
Anisotropy	0.769	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.46 , 50.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	10071	wwPDB-VP
Average B, all atoms (Å ²)	8.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.52% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ACT, 6NT, GOL

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	0.53	2/2427 (0.1%)	0.78	0/3306
1	B	0.57	0/2425	0.84	3/3303 (0.1%)
All	All	0.55	2/4852 (0.0%)	0.81	3/6609 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	2
All	All	0	3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	46[A]	GLU	CD-OE1	5.25	1.31	1.25
1	A	46[B]	GLU	CD-OE1	5.25	1.31	1.25

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	124	ARG	NE-CZ-NH2	-6.47	117.07	120.30
1	B	267	PHE	CB-CG-CD2	-5.61	116.88	120.80
1	B	276	ARG	NE-CZ-NH2	-5.11	117.74	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	124	ARG	Sidechain
1	B	124	ARG	Sidechain
1	B	195[A]	ARG	Sidechain

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	2378	2333	2317	13	0
1	B	2376	2340	2325	15	0
2	A	12	4	4	1	0
2	B	12	4	4	1	0
3	A	24	32	32	1	0
3	B	18	24	24	3	0
4	B	4	3	3	0	0
5	A	266	0	0	4	0
5	B	241	0	0	2	0
All	All	5331	4740	4709	27	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 (27) 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:75:GLN:NE2	5:A:501:HOH:O	2.03	0.89
1:A:84[B]:MET:HE3	1:A:127:ASP:HB3	1.68	0.75
1:B:84[B]:MET:HG2	2:B:401:6NT:N2	2.05	0.71
1:A:71[B]:ASN:ND2	1:A:75:GLN:OE1	2.24	0.69
1:B:84[B]:MET:HE3	1:B:127:ASP:HB3	1.75	0.68
1:B:109:LYS:O	1:B:113[B]:THR:HG23	1.94	0.68
1:B:190[B]:LYS:NZ	5:B:502:HOH:O	2.33	0.57
1:A:25[B]:ASN:ND2	5:A:503:HOH:O	2.30	0.56
1:B:84[B]:MET:CE	1:B:127:ASP:HB3	2.36	0.56
1:A:4:GLN:N	3:A:404:GOL:HO3	2.06	0.54
1:A:84[B]:MET:HG2	2:A:401:6NT:N2	2.23	0.53
1:A:46[B]:GLU:HG2	5:A:568:HOH:O	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:403:GOL:O3	5:B:501:HOH:O	2.20	0.49
1:B:207[B]:MET:SD	1:B:237:MET:SD	3.12	0.47
1:B:84[A]:MET:SD	1:B:127:ASP:HB3	2.55	0.46
1:A:84[A]:MET:SD	1:A:127:ASP:HB3	2.56	0.46
1:A:179:ALA:CB	1:B:29:THR:HG21	2.47	0.44
1:B:135:GLU:H	3:B:403:GOL:C1	2.31	0.44
1:B:24:GLN:O	1:B:28:THR:HG23	2.18	0.43
1:A:203:GLY:HA2	1:A:232:GLU:O	2.19	0.42
1:B:203:GLY:HA2	1:B:232:GLU:O	2.19	0.42
1:B:135:GLU:H	3:B:403:GOL:H11	1.85	0.41
1:B:272:PRO:HD3	1:B:286:GLY:HA2	2.01	0.41
1:B:272:PRO:CD	1:B:286:GLY:HA2	2.50	0.41
1:A:11[B]:LYS:HE3	5:A:617:HOH:O	2.21	0.41
1:A:224:LEU:HD13	1:B:28:THR:OG1	2.21	0.41
1:A:26:ARG:NE	1:A:26:ARG:HA	2.36	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	311/318 (98%)	307 (99%)	4 (1%)	0	100	100
1	B	311/318 (98%)	306 (98%)	5 (2%)	0	100	100
All	All	622/636 (98%)	613 (99%)	9 (1%)	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	256/255 (100%)	255 (100%)	1 (0%)	89	79
1	B	256/255 (100%)	254 (99%)	2 (1%)	79	62
All	All	512/510 (100%)	509 (99%)	3 (1%)	84	70

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	267	PHE
1	B	23	ASP
1	B	267	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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](#)

10 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	GOL	A	405	-	5,5,5	0.19	0	5,5,5	1.04	0
3	GOL	B	403	-	5,5,5	0.52	0	5,5,5	0.64	0
2	6NT	A	401	-	8,13,13	1.14	1 (12%)	10,18,18	1.90	3 (30%)
3	GOL	B	402	-	5,5,5	0.25	0	5,5,5	0.54	0
3	GOL	B	404	-	5,5,5	0.15	0	5,5,5	0.13	0
4	ACT	B	405	-	3,3,3	0.66	0	3,3,3	1.16	0
3	GOL	A	404	-	5,5,5	0.10	0	5,5,5	0.30	0
3	GOL	A	402	-	5,5,5	0.27	0	5,5,5	0.49	0
3	GOL	A	403	-	5,5,5	0.26	0	5,5,5	0.85	0
2	6NT	B	401	-	8,13,13	1.10	1 (12%)	10,18,18	1.76	3 (30%)

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	GOL	A	405	-	-	2/4/4/4	-
3	GOL	B	403	-	-	4/4/4/4	-
2	6NT	A	401	-	-	0/2/4/4	0/2/2/2
3	GOL	B	402	-	-	0/4/4/4	-
3	GOL	B	404	-	-	0/4/4/4	-
3	GOL	A	404	-	-	0/4/4/4	-
3	GOL	A	402	-	-	0/4/4/4	-
3	GOL	A	403	-	-	2/4/4/4	-
2	6NT	B	401	-	-	0/2/4/4	0/2/2/2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	401	6NT	C4-C3A	-2.21	1.38	1.41
2	A	401	6NT	C4-C3A	-2.02	1.38	1.41

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	6NT	C5-C4-C3A	-4.06	114.60	118.53
2	B	401	6NT	C5-C4-C3A	-3.09	115.53	118.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	401	6NT	C6-C7-C7A	-2.89	117.20	120.84
2	A	401	6NT	C6-C7-C7A	-2.66	117.49	120.84
2	B	401	6NT	N3-N2-N1	-2.47	108.05	111.25
2	A	401	6NT	N3-N2-N1	-2.03	108.62	111.25

There are no chirality outliers.

All (8) torsion outliers are listed below:

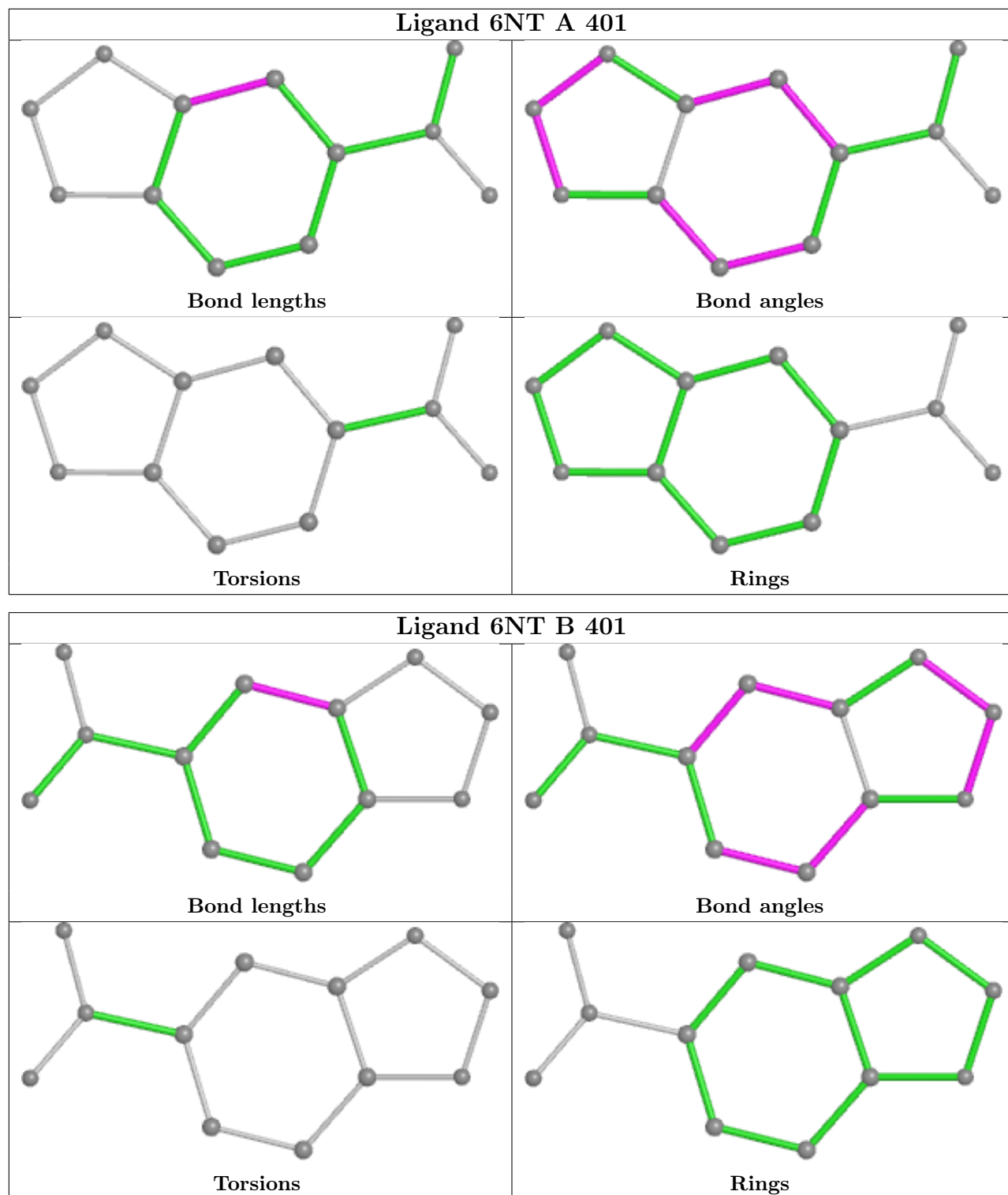
Mol	Chain	Res	Type	Atoms
3	A	403	GOL	O1-C1-C2-C3
3	A	405	GOL	C1-C2-C3-O3
3	B	403	GOL	O1-C1-C2-C3
3	B	403	GOL	C1-C2-C3-O3
3	B	403	GOL	O2-C2-C3-O3
3	A	405	GOL	O2-C2-C3-O3
3	B	403	GOL	O1-C1-C2-O2
3	A	403	GOL	O1-C1-C2-O2

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	403	GOL	3	0
2	A	401	6NT	1	0
3	A	404	GOL	1	0
2	B	401	6NT	1	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 than 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.



5.7 Other polymers [i](#)

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 [i](#)

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

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	300/318 (94%)	-1.00	0 100 100	3, 7, 15, 25	13 (4%)
1	B	300/318 (94%)	-1.02	0 100 100	2, 6, 13, 25	13 (4%)
All	All	600/636 (94%)	-1.01	0 100 100	2, 7, 14, 25	26 (4%)

There are no RSRZ outliers to report.

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 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.

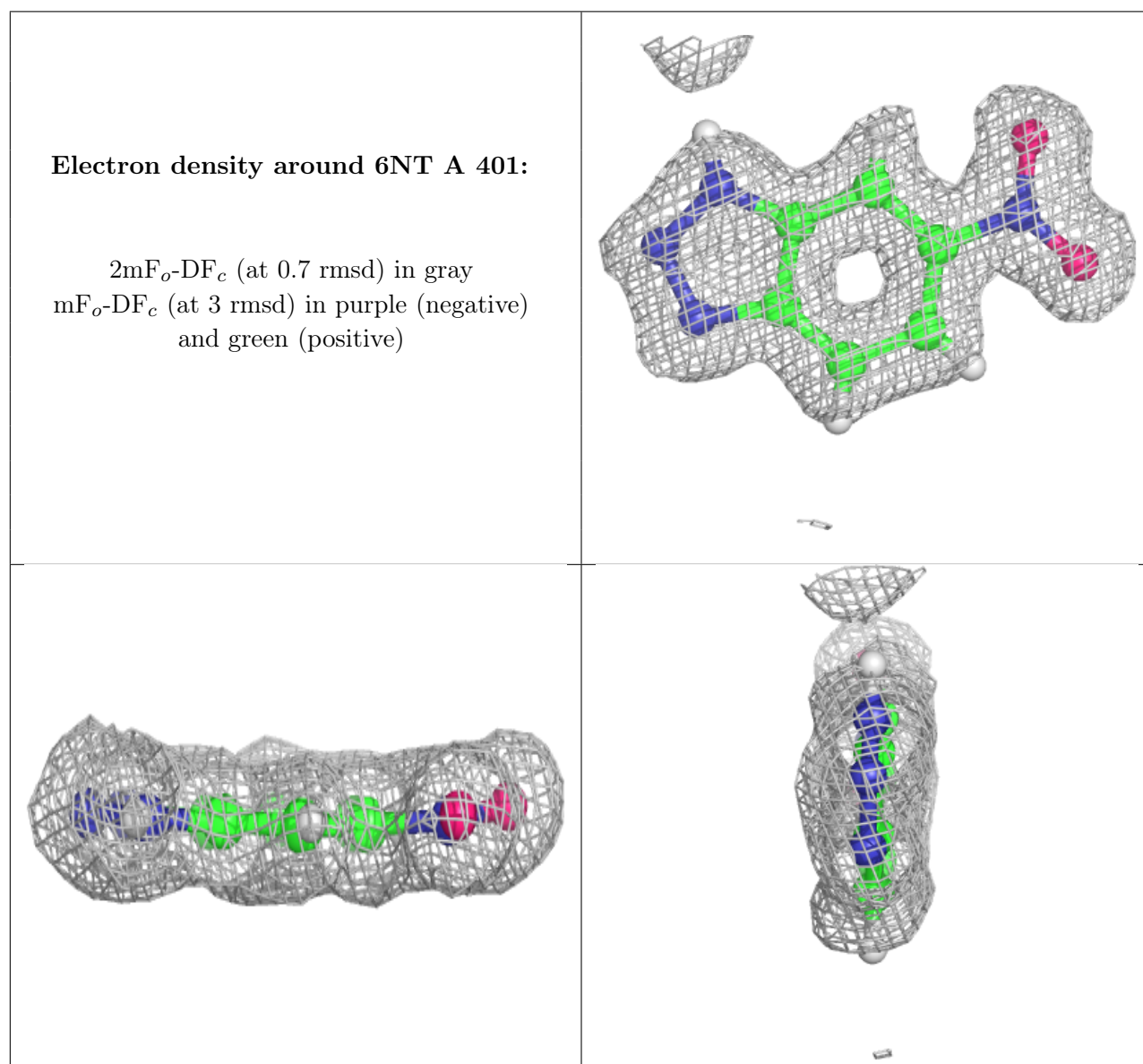
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	GOL	B	403	6/6	0.88	0.12	19,23,26,28	2
3	GOL	A	405	6/6	0.90	0.12	17,19,35,35	2
3	GOL	A	404	6/6	0.94	0.07	20,24,28,29	2
3	GOL	B	404	6/6	0.94	0.08	19,26,33,34	2
4	ACT	B	405	4/4	0.94	0.10	23,24,27,28	0
3	GOL	A	403	6/6	0.96	0.07	12,15,23,23	2
3	GOL	A	402	6/6	0.98	0.04	8,9,11,12	2

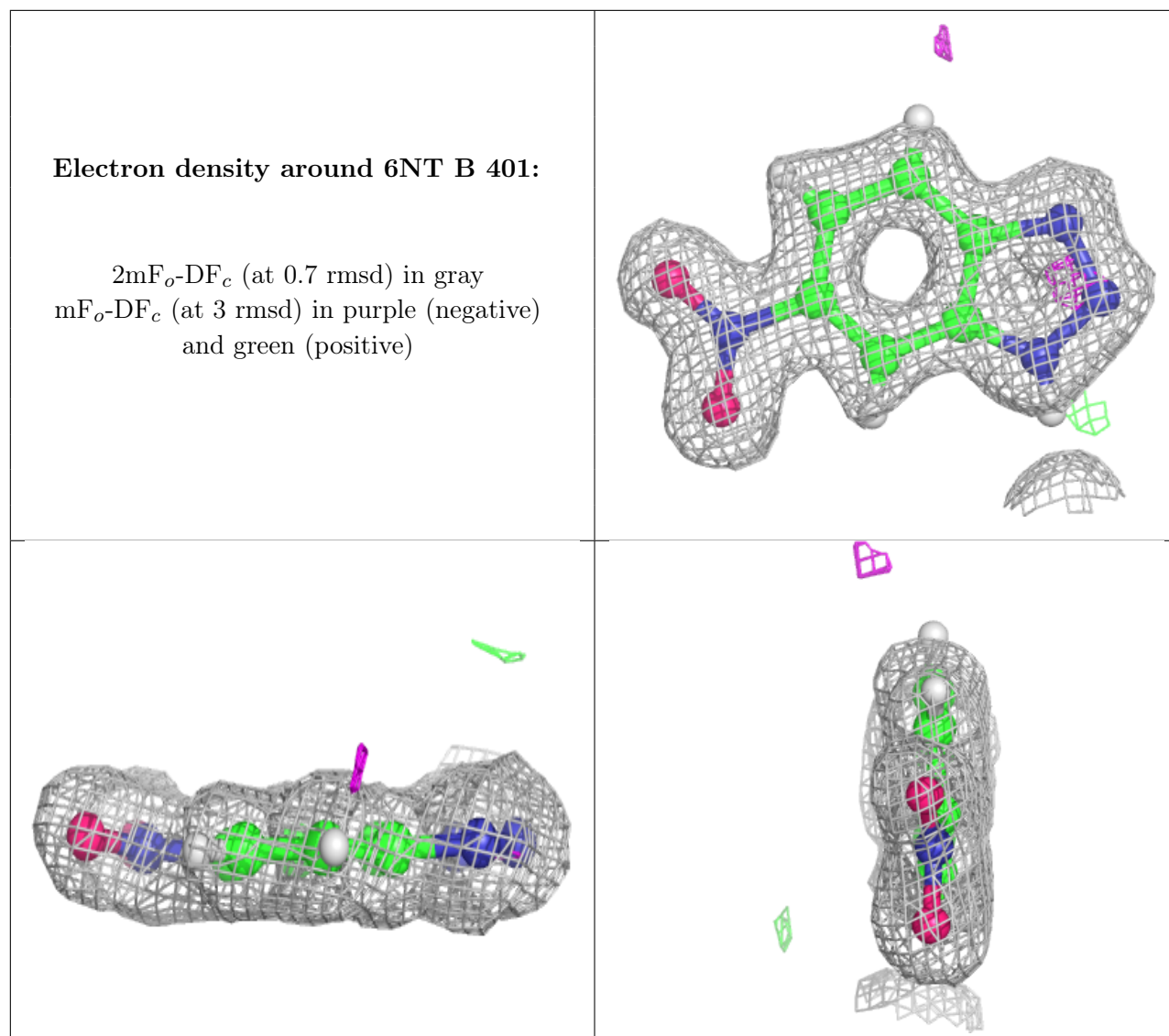
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	6NT	A	401	12/12	0.98	0.04	7,7,8,9	0
3	GOL	B	402	6/6	0.98	0.05	10,14,18,19	2
2	6NT	B	401	12/12	0.99	0.06	6,7,8,9	0

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.





6.5 Other polymers [i](#)

There are no such residues in this entry.