



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 10, 2026 – 02:17 PM UTC

PDB ID : 5G2Q / pdb_00005g2q
Title : The crystal structure of a S-selective transaminase from *Arthrobacter* sp. with alanine bound
Authors : van Oosterwijk, N.; Willies, S.; Hekelaar, J.; Terwisscha van Scheltinga, A.C.; Turner, N.J.; Dijkstra, B.W.
Deposited on : 2016-04-12
Resolution : 2.30 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
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

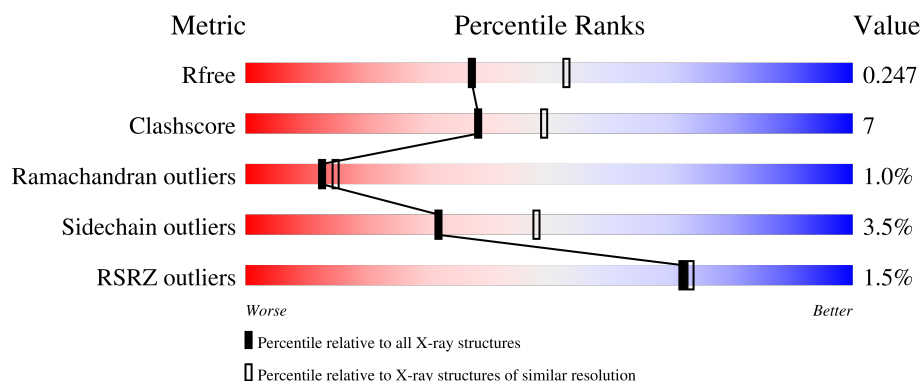
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	485	 80% 14% • 5%
1	B	485	 82% 12% • 5%
1	C	485	 80% 13% • 5%
1	D	485	 82% 12% • •

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Mol	Chain	Length	Quality of chain
1	E	485	78% 16% • 5%
1	F	485	77% 17% • •
1	G	485	81% 13% • 5%
1	H	485	79% 15% • 5%
1	I	485	% 75% 18% • 5%
1	J	485	5% 76% 18% • 5%
1	K	485	3% 70% 22% • 5%
1	L	485	6% 71% 21% • 5%

2 Entry composition

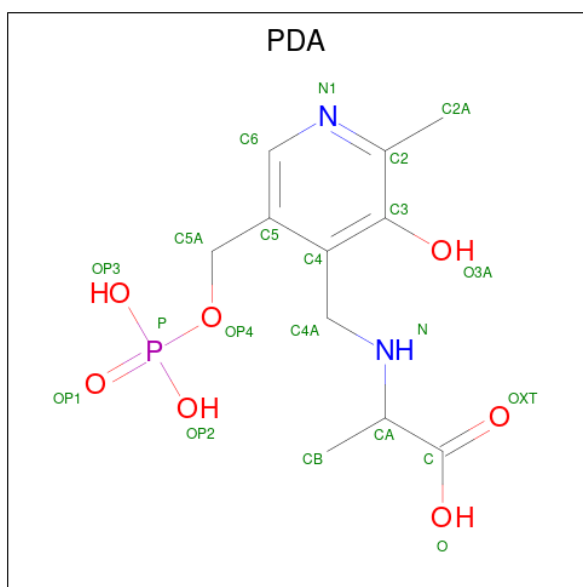
There are 3 unique types of molecules in this entry. The entry contains 44561 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 TRANSAMINASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	B	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	C	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	D	465	Total	C	N	O	S	0	0	0
			3650	2310	622	700	18			
1	E	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	F	465	Total	C	N	O	S	0	0	0
			3650	2310	622	700	18			
1	G	459	Total	C	N	O	S	0	0	0
			3607	2288	613	688	18			
1	H	462	Total	C	N	O	S	0	0	0
			3629	2300	618	693	18			
1	I	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	J	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	K	461	Total	C	N	O	S	0	0	0
			3624	2297	617	692	18			
1	L	460	Total	C	N	O	S	0	0	0
			3615	2291	615	691	18			

- Molecule 2 is 2-[(3-HYDROXY-2-METHYL-5-PHOSPHONOXYMETHYL-PYRIDIN-4-YLMETHYL)-AMINO]-PROPIONIC ACID (CCD ID: PDA) (formula: C₁₁H₁₇N₂O₇P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	B	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	C	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	D	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	E	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	F	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	G	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	H	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	I	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	J	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	K	1	Total	C	N	O	P	0	0
			21	11	2	7	1		
2	L	1	Total	C	N	O	P	0	0
			21	11	2	7	1		

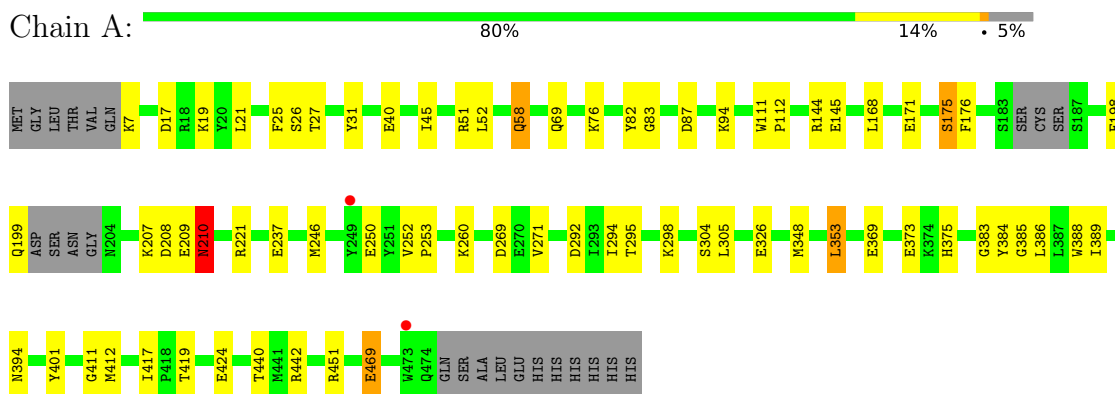
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	162	Total 162	O 162	0	0
3	B	110	Total 110	O 110	0	0
3	C	80	Total 80	O 80	0	0
3	D	66	Total 66	O 66	0	0
3	E	63	Total 63	O 63	0	0
3	F	64	Total 64	O 64	0	0
3	G	90	Total 90	O 90	0	0
3	H	74	Total 74	O 74	0	0
3	I	38	Total 38	O 38	0	0
3	J	17	Total 17	O 17	0	0
3	K	12	Total 12	O 12	0	0
3	L	14	Total 14	O 14	0	0

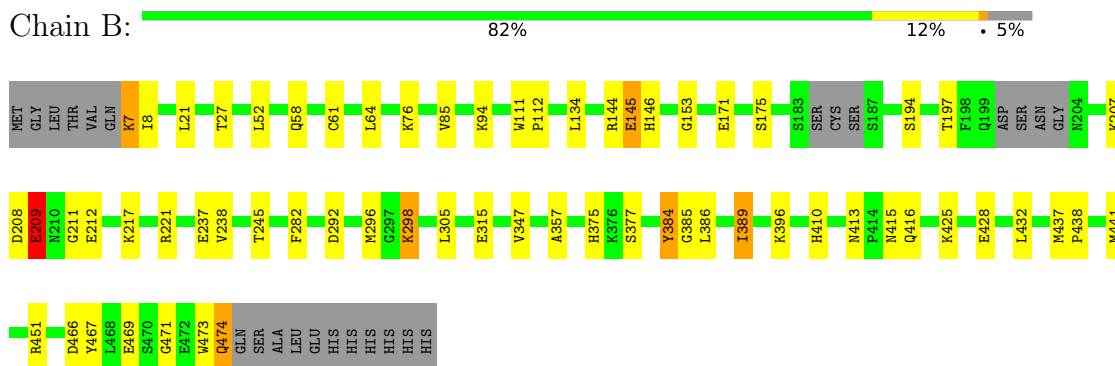
3 Residue-property plots

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.

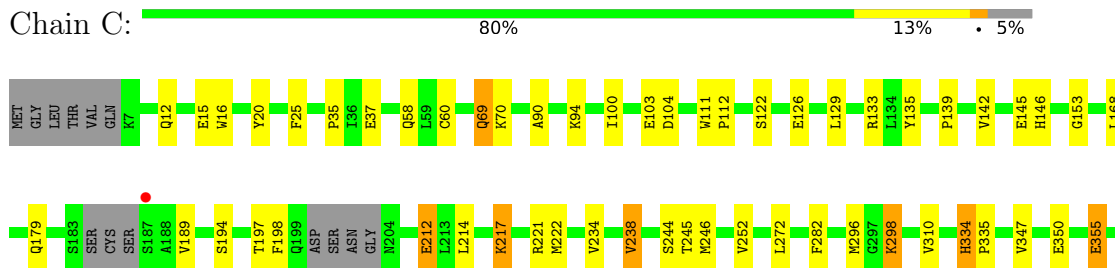
• Molecule 1: TRANSAMINASE



• Molecule 1: TRANSAMINASE



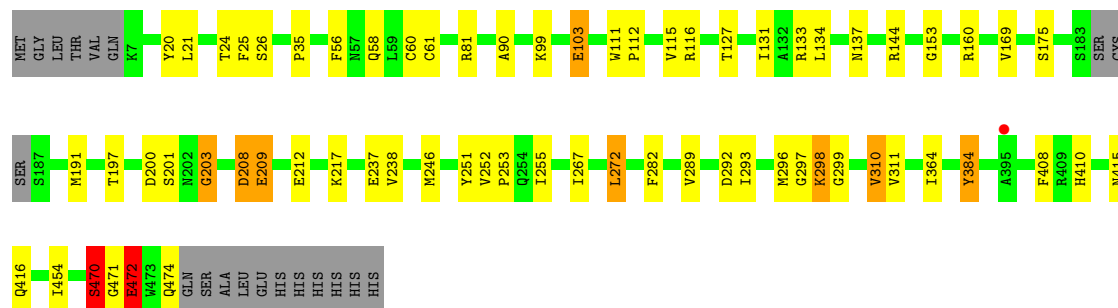
• Molecule 1: TRANSAMINASE





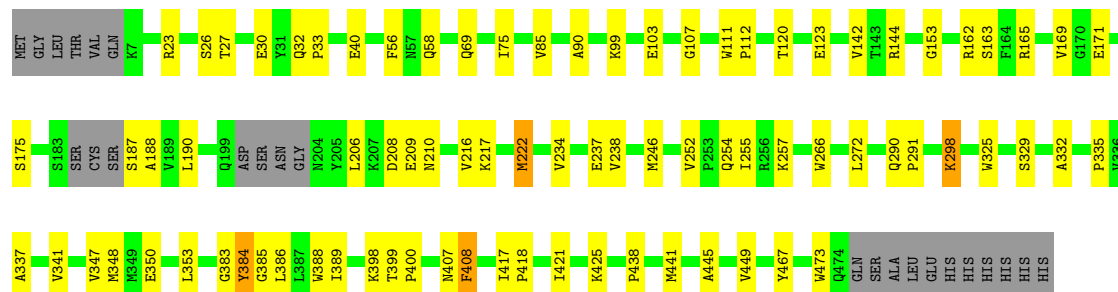
• Molecule 1: TRANSAMINASE

Chain D: 82% 12% . .



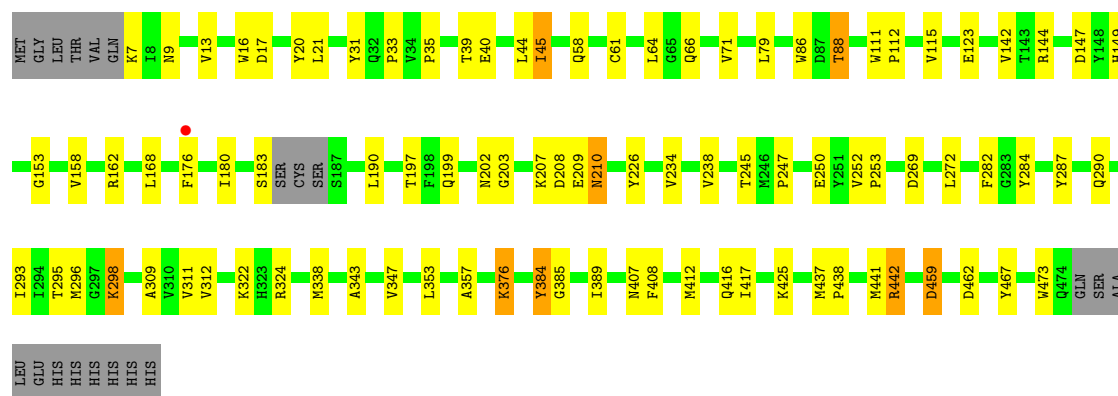
• Molecule 1: TRANSAMINASE

Chain E: 78% 16% . 5%



• Molecule 1: TRANSAMINASE

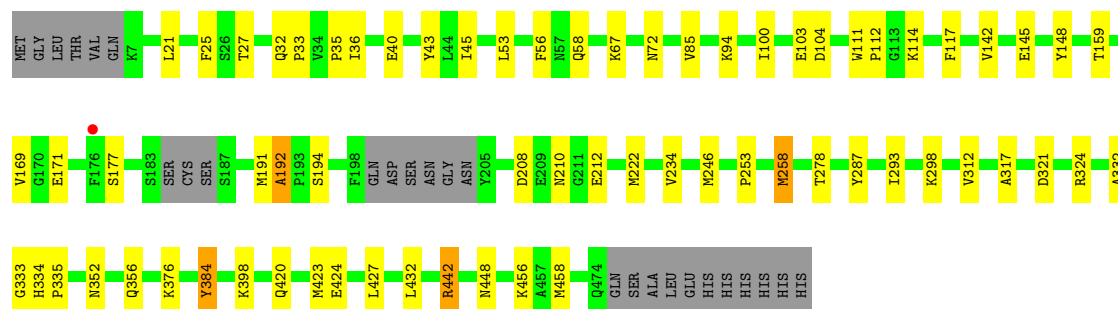
Chain F: 77% 17% . .



• Molecule 1: TRANSAMINASE

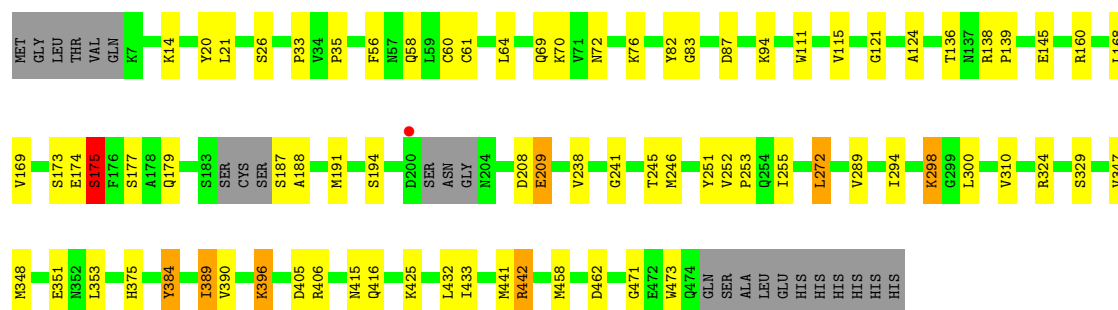
Chain G: 81% 13% . 5%





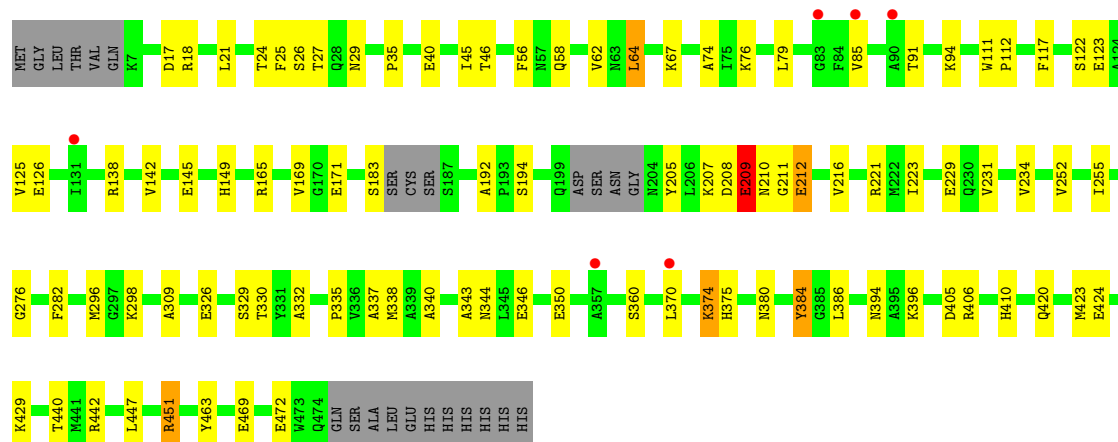
• Molecule 1: TRANSAMINASE

Chain H: 79% 15% • 5%



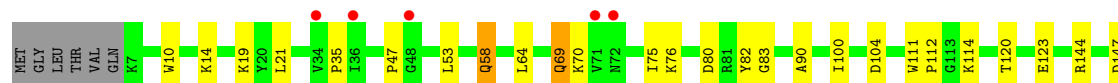
• Molecule 1: TRANSAMINASE

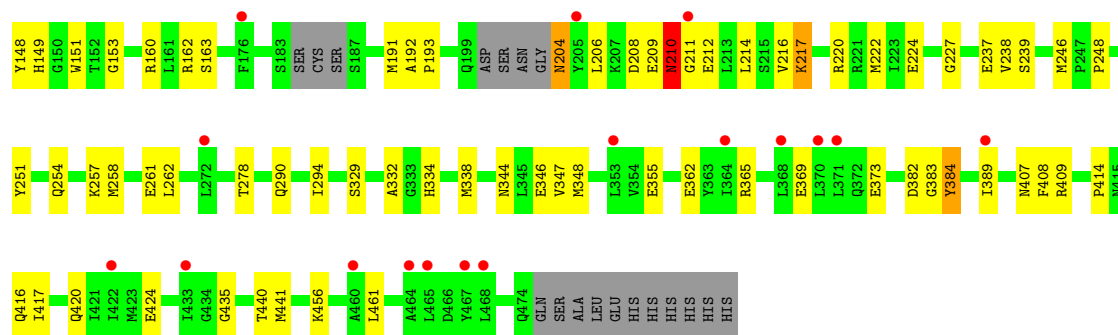
Chain I: 75% 18% • 5%



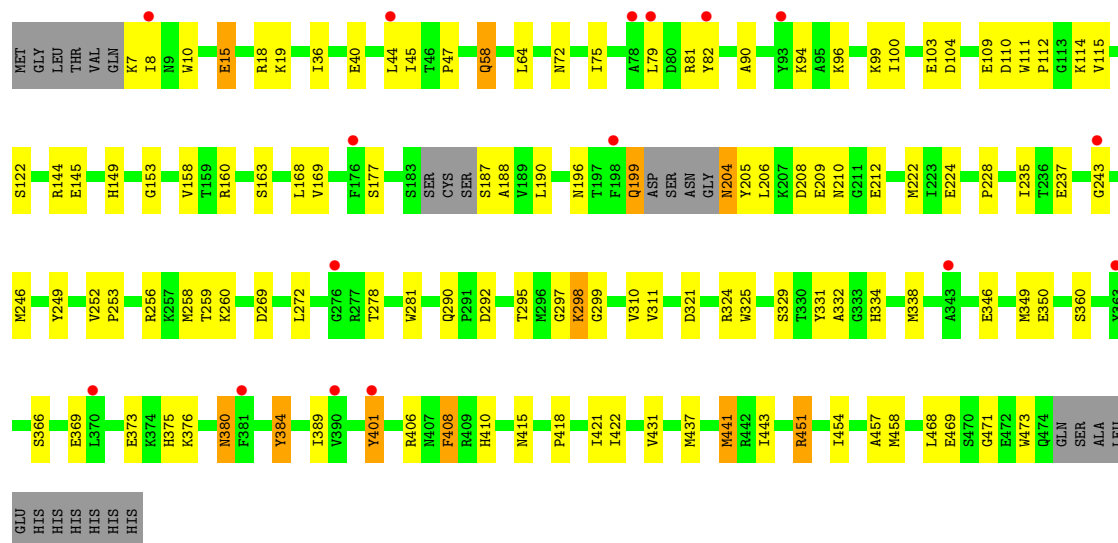
• Molecule 1: TRANSAMINASE

Chain J: 76% 18% • 5%

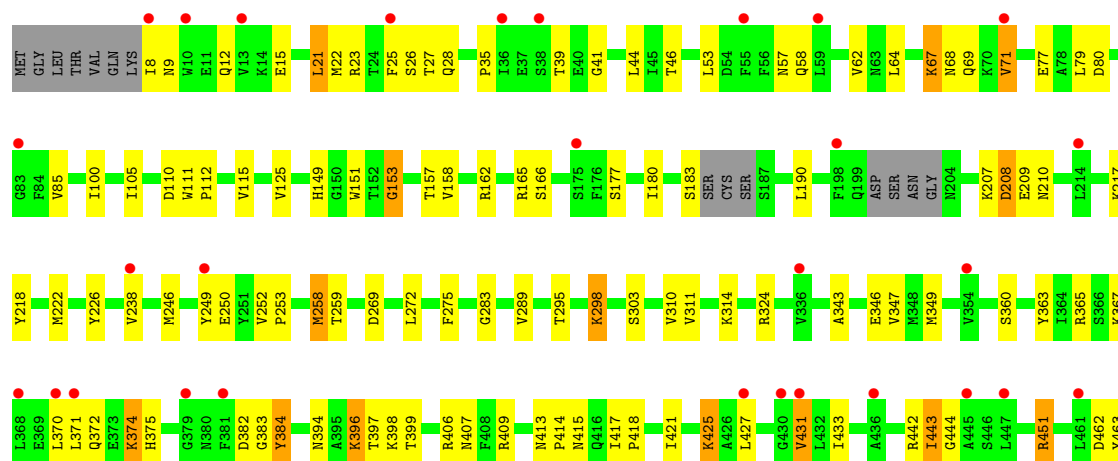




• Molecule 1: TRANSAMINASE



• Molecule 1: TRANSAMINASE



473	
474	
GLN	
SER	
ALA	
LEU	
GLU	
HIS	
HIS	
HIS	
HIS	
HIS	

4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	64.28Å 99.81Å 217.34Å 81.58° 89.12° 74.49°	Depositor
Resolution (Å)	47.96 – 2.30 47.96 – 2.30	Depositor EDS
% Data completeness (in resolution range)	93.7 (47.96-2.30) 93.8 (47.96-2.30)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.87 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.192 , 0.249 0.184 , 0.247	Depositor DCC
R_{free} test set	10758 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	29.6	Xtriage
Anisotropy	0.900	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 61.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	44561	wwPDB-VP
Average B, all atoms (Å ²)	74.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.46% 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: PDA

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	0.88	0/3700	1.08	9/5009 (0.2%)
1	B	0.90	0/3700	1.08	6/5009 (0.1%)
1	C	0.81	0/3700	1.04	7/5009 (0.1%)
1	D	0.80	0/3727	1.05	6/5047 (0.1%)
1	E	0.77	0/3700	1.05	6/5009 (0.1%)
1	F	0.80	0/3727	1.04	2/5047 (0.0%)
1	G	0.81	0/3683	1.02	5/4986 (0.1%)
1	H	0.87	1/3705 (0.0%)	1.05	3/5016 (0.1%)
1	I	0.70	0/3700	1.02	7/5009 (0.1%)
1	J	0.69	0/3700	1.00	4/5009 (0.1%)
1	K	0.63	1/3700 (0.0%)	0.95	1/5009 (0.0%)
1	L	0.73	5/3691 (0.1%)	1.03	8/4998 (0.2%)
All	All	0.79	7/44433 (0.0%)	1.03	64/60157 (0.1%)

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	B	0	1
1	F	0	1
All	All	0	2

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	443	ILE	C-N	10.70	1.47	1.33
1	L	443	ILE	CA-C	8.03	1.62	1.52
1	L	425	LYS	CG-CD	7.63	1.75	1.52
1	L	374	LYS	CB-CG	6.81	1.72	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	444	GLY	CA-C	6.79	1.57	1.51

The worst 5 of 64 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	210	ASN	N-CA-C	-8.76	102.59	113.28
1	L	443	ILE	CB-CA-C	-8.13	98.45	110.81
1	B	175	SER	N-CA-C	7.59	120.63	111.82
1	E	290	GLN	CA-C-N	7.24	127.16	120.21
1	E	290	GLN	C-N-CA	7.24	127.16	120.21

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	207	LYS	Peptide
1	F	176	PHE	Peptide

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	3624	0	3573	40	0
1	B	3624	0	3573	41	0
1	C	3624	0	3573	46	0
1	D	3650	0	3592	45	0
1	E	3624	0	3573	46	0
1	F	3650	0	3592	67	0
1	G	3607	0	3559	43	0
1	H	3629	0	3575	52	0
1	I	3624	0	3573	62	0
1	J	3624	0	3573	55	0
1	K	3624	0	3573	79	0
1	L	3615	0	3560	73	0
2	A	21	0	13	2	0
2	B	21	0	13	3	0
2	C	21	0	13	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	21	0	14	2	0
2	E	21	0	13	0	0
2	F	21	0	14	4	0
2	G	21	0	14	0	0
2	H	21	0	14	0	0
2	I	21	0	14	2	0
2	J	21	0	13	1	0
2	K	21	0	12	1	0
2	L	21	0	12	1	0
3	A	162	0	0	1	0
3	B	110	0	0	2	0
3	C	80	0	0	2	0
3	D	66	0	0	0	0
3	E	63	0	0	0	0
3	F	64	0	0	0	0
3	G	90	0	0	1	0
3	H	74	0	0	2	0
3	I	38	0	0	1	0
3	J	17	0	0	0	0
3	K	12	0	0	0	0
3	L	14	0	0	2	0
All	All	44561	0	43048	595	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 7.

The worst 5 of 595 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:L:425:LYS:CD	1:L:425:LYS:CG	1.75	1.58
1:H:208:ASP:O	1:H:209:GLU:HG2	1.41	1.19
1:L:8:ILE:HG22	1:L:9:ASN:H	1.12	1.11
3:A:2078:HOH:O	1:C:221:ARG:HD3	1.64	0.95
1:G:192:ALA:HA	1:G:222:MET:HE1	1.56	0.88

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	455/485 (94%)	429 (94%)	22 (5%)	4 (1%)	14	17
1	B	455/485 (94%)	429 (94%)	22 (5%)	4 (1%)	14	17
1	C	455/485 (94%)	428 (94%)	22 (5%)	5 (1%)	11	13
1	D	461/485 (95%)	429 (93%)	26 (6%)	6 (1%)	9	10
1	E	455/485 (94%)	430 (94%)	21 (5%)	4 (1%)	14	17
1	F	461/485 (95%)	435 (94%)	23 (5%)	3 (1%)	18	23
1	G	453/485 (93%)	430 (95%)	20 (4%)	3 (1%)	18	23
1	H	456/485 (94%)	434 (95%)	18 (4%)	4 (1%)	14	17
1	I	455/485 (94%)	421 (92%)	30 (7%)	4 (1%)	14	17
1	J	455/485 (94%)	422 (93%)	31 (7%)	2 (0%)	30	38
1	K	455/485 (94%)	420 (92%)	30 (7%)	5 (1%)	11	13
1	L	454/485 (94%)	419 (92%)	27 (6%)	8 (2%)	6	6
All	All	5470/5820 (94%)	5126 (94%)	292 (5%)	52 (1%)	12	15

5 of 52 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	K	153	GLY
1	K	209	GLU
1	A	87	ASP
1	B	209	GLU
1	D	153	GLY

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	388/409 (95%)	375 (97%)	13 (3%)	32	49
1	B	388/409 (95%)	376 (97%)	12 (3%)	35	52
1	C	388/409 (95%)	373 (96%)	15 (4%)	28	43
1	D	391/409 (96%)	379 (97%)	12 (3%)	35	52
1	E	388/409 (95%)	375 (97%)	13 (3%)	32	49
1	F	391/409 (96%)	377 (96%)	14 (4%)	31	47
1	G	386/409 (94%)	381 (99%)	5 (1%)	61	77
1	H	388/409 (95%)	373 (96%)	15 (4%)	28	43
1	I	388/409 (95%)	378 (97%)	10 (3%)	40	59
1	J	388/409 (95%)	371 (96%)	17 (4%)	25	38
1	K	388/409 (95%)	369 (95%)	19 (5%)	22	34
1	L	387/409 (95%)	368 (95%)	19 (5%)	22	34
All	All	4659/4908 (95%)	4495 (96%)	164 (4%)	32	48

5 of 164 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	J	238	VAL
1	K	441	MET
1	J	355	GLU
1	K	64	LEU
1	L	71	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
1	J	290	GLN
1	L	12	GLN
1	J	359	ASN
1	K	372	GLN
1	L	372	GLN

5.3.3 RNA ⓘ

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](#)

12 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	$\# Z > 2$
2	PDA	J	1000	-	20,21,21	2.26	2 (10%)	26,30,30	1.12	1 (3%)
2	PDA	I	1000	-	20,21,21	2.36	2 (10%)	26,30,30	1.48	7 (26%)
2	PDA	C	1000	-	20,21,21	2.34	3 (15%)	26,30,30	1.38	3 (11%)
2	PDA	A	1000	-	20,21,21	2.31	2 (10%)	26,30,30	1.14	2 (7%)
2	PDA	L	1000	-	20,21,21	2.57	3 (15%)	26,30,30	1.55	4 (15%)
2	PDA	F	1000	-	20,21,21	2.54	2 (10%)	26,30,30	1.28	2 (7%)
2	PDA	H	1000	-	20,21,21	2.52	2 (10%)	26,30,30	1.55	3 (11%)
2	PDA	D	1000	-	20,21,21	2.17	3 (15%)	26,30,30	1.59	6 (23%)
2	PDA	G	1000	-	20,21,21	2.23	3 (15%)	26,30,30	1.34	4 (15%)
2	PDA	E	1000	-	20,21,21	2.43	2 (10%)	26,30,30	1.38	2 (7%)
2	PDA	K	1000	-	20,21,21	2.26	2 (10%)	26,30,30	1.36	3 (11%)
2	PDA	B	1000	-	20,21,21	2.18	3 (15%)	26,30,30	1.55	6 (23%)

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
2	PDA	J	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	I	1000	-	-	8/15/15/15	0/1/1/1
2	PDA	C	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	A	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	L	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	F	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	H	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	D	1000	-	-	4/15/15/15	0/1/1/1
2	PDA	G	1000	-	-	6/15/15/15	0/1/1/1
2	PDA	E	1000	-	-	8/15/15/15	0/1/1/1
2	PDA	K	1000	-	-	5/15/15/15	0/1/1/1
2	PDA	B	1000	-	-	5/15/15/15	0/1/1/1

The worst 5 of 29 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	1000	PDA	C3-C2	8.73	1.50	1.41
2	H	1000	PDA	C3-C2	8.28	1.49	1.41
2	E	1000	PDA	C3-C2	7.94	1.49	1.41
2	I	1000	PDA	C3-C2	7.42	1.48	1.41
2	L	1000	PDA	C4A-N	-7.38	1.25	1.46

The worst 5 of 43 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	1000	PDA	C6-C5-C4	4.77	121.67	118.06
2	L	1000	PDA	OP4-C5A-C5	4.04	116.93	109.36
2	D	1000	PDA	C4A-C4-C5	3.55	123.62	119.75
2	B	1000	PDA	C4A-C4-C5	3.54	123.60	119.75
2	E	1000	PDA	C4A-C4-C5	3.21	123.24	119.75

There are no chirality outliers.

5 of 66 torsion outliers are listed below:

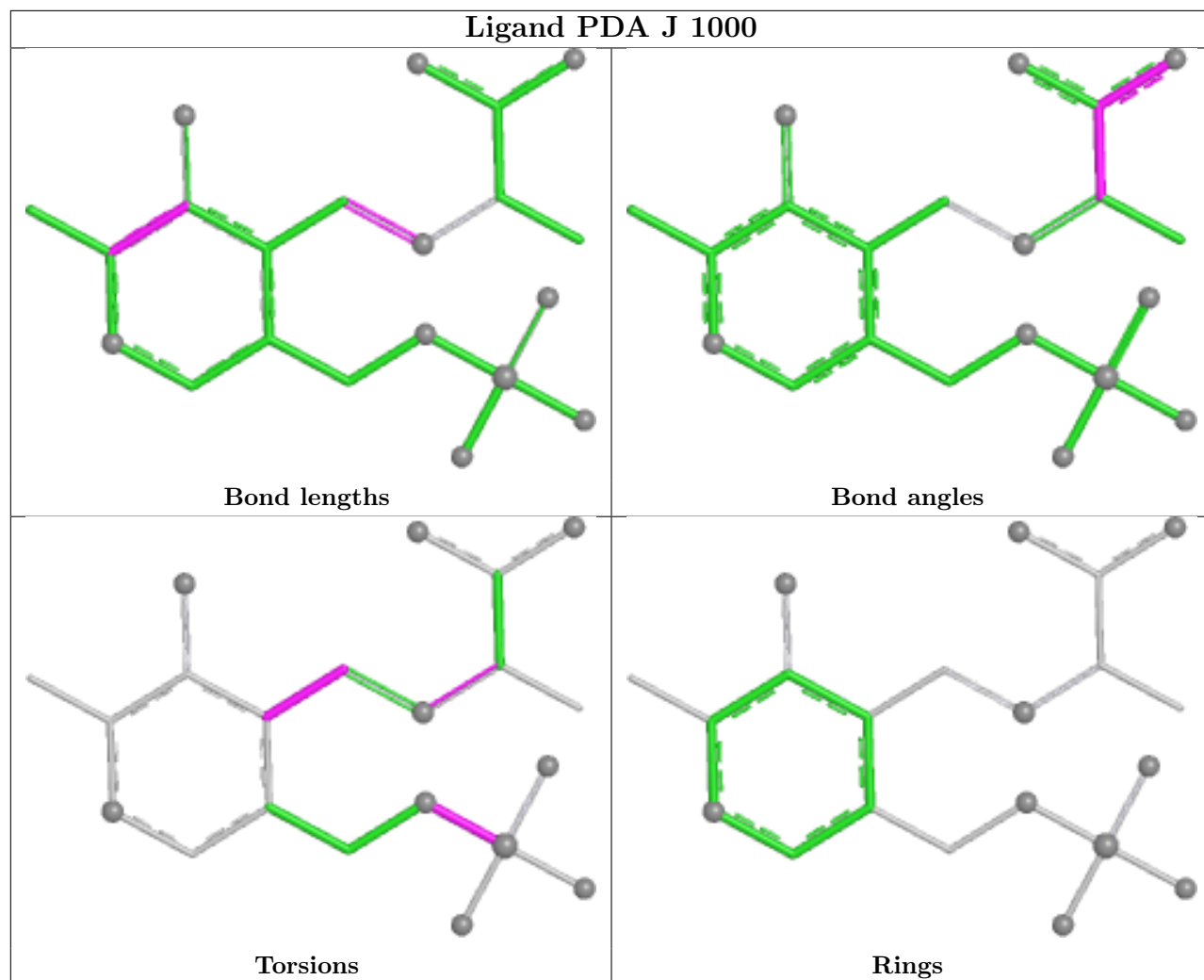
Mol	Chain	Res	Type	Atoms
2	A	1000	PDA	C5-C4-C4A-N
2	B	1000	PDA	C-CA-N-C4A
2	C	1000	PDA	CB-CA-N-C4A
2	C	1000	PDA	C-CA-N-C4A
2	D	1000	PDA	CB-CA-N-C4A

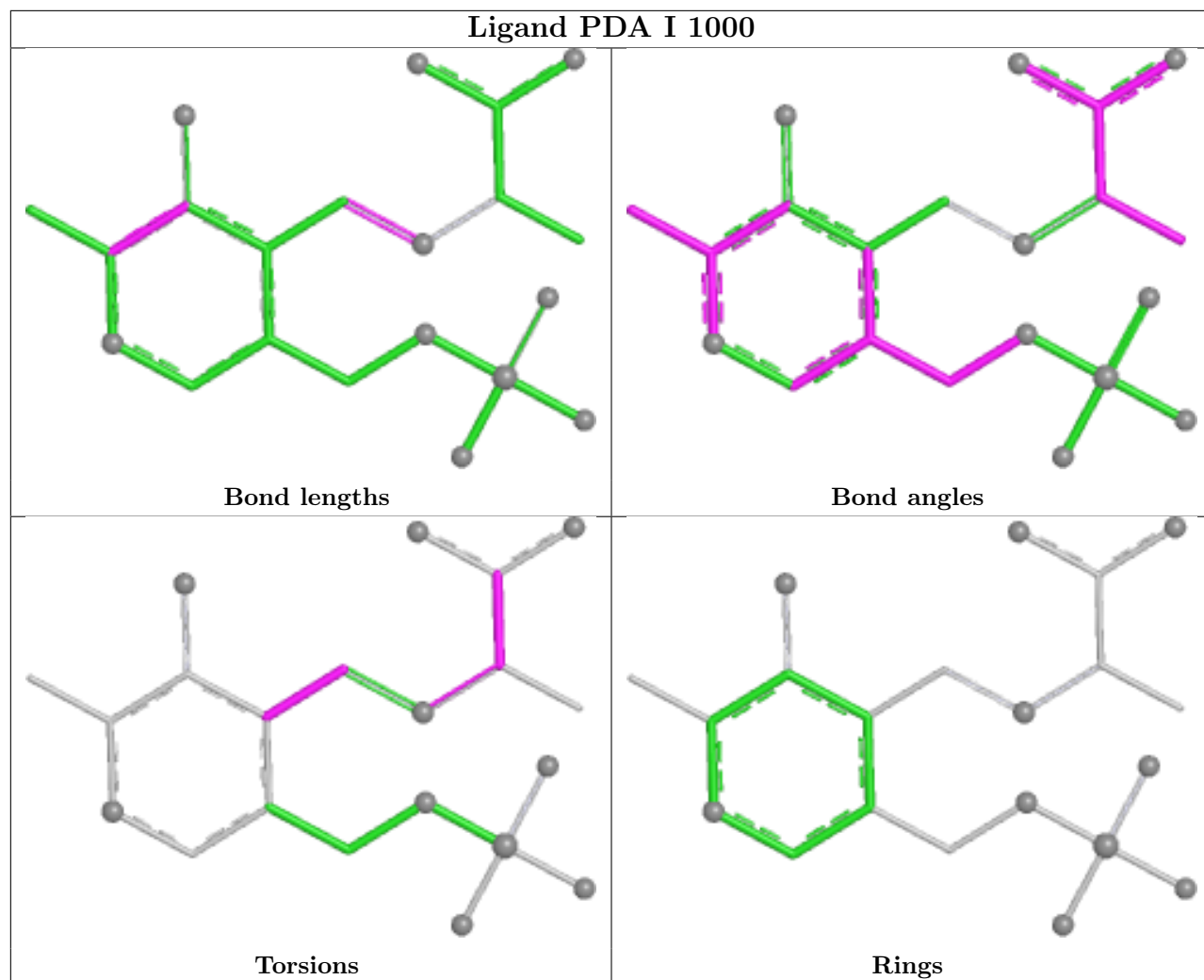
There are no ring outliers.

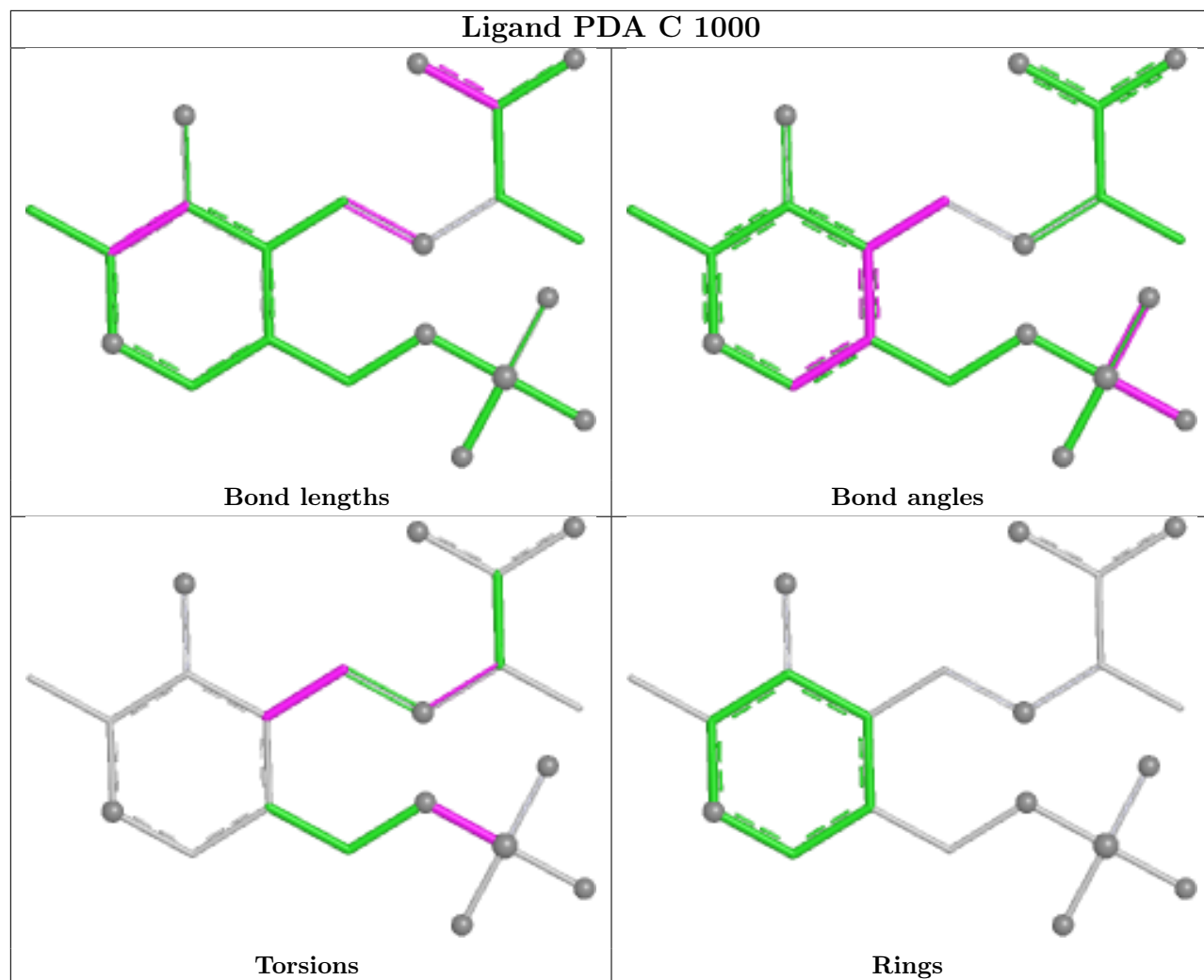
9 monomers are involved in 19 short contacts:

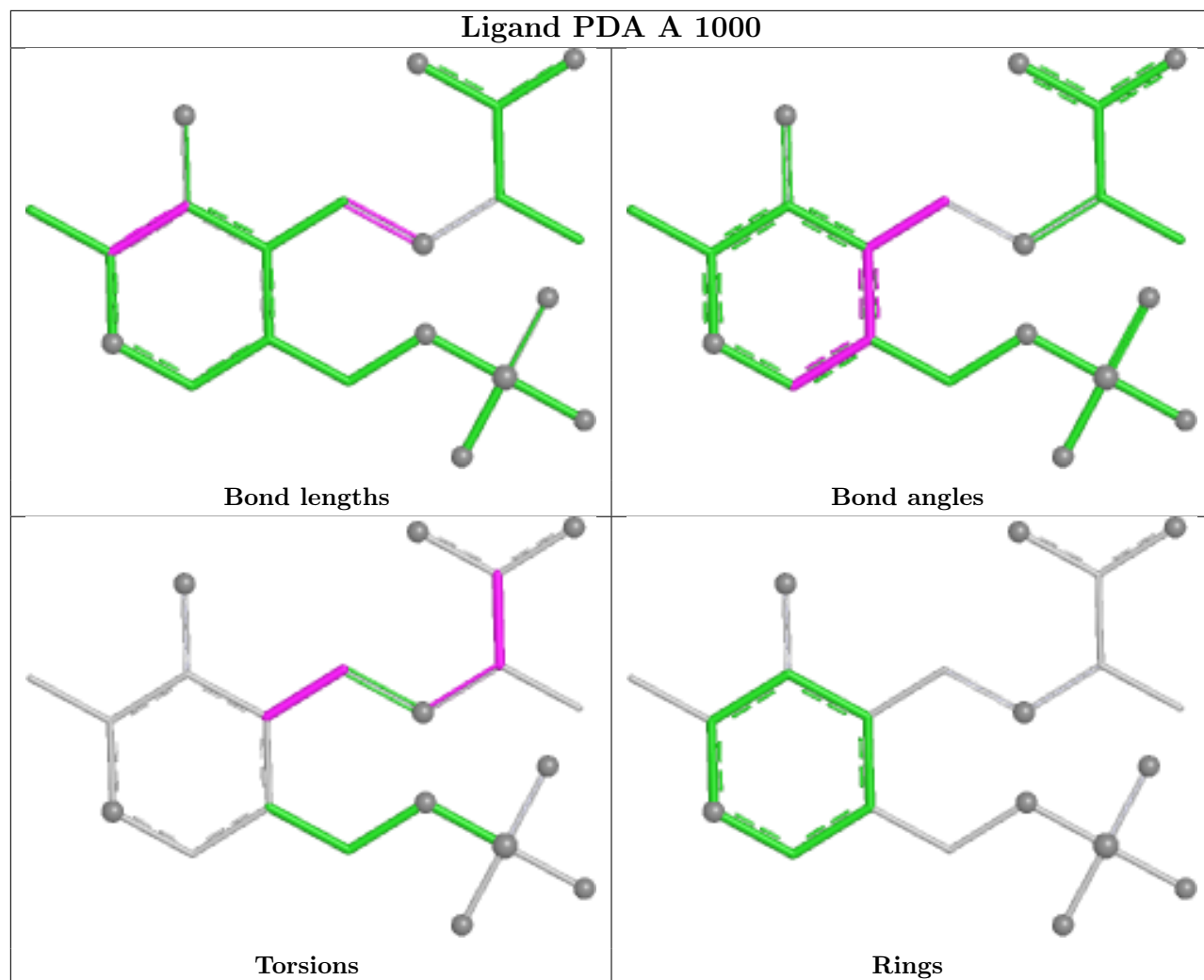
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	1000	PDA	1	0
2	I	1000	PDA	2	0
2	C	1000	PDA	3	0
2	A	1000	PDA	2	0
2	L	1000	PDA	1	0
2	F	1000	PDA	4	0
2	D	1000	PDA	2	0
2	K	1000	PDA	1	0
2	B	1000	PDA	3	0

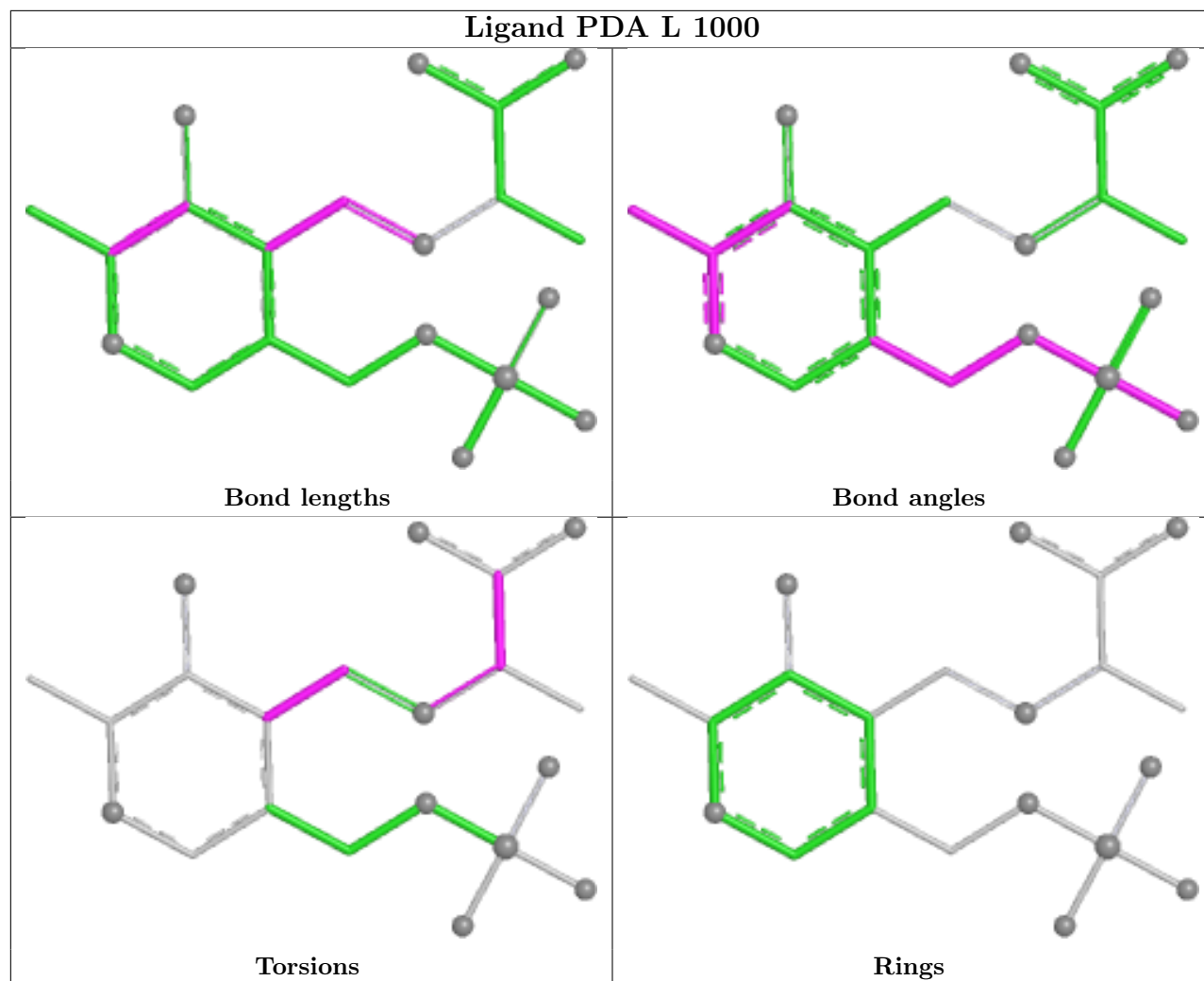
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

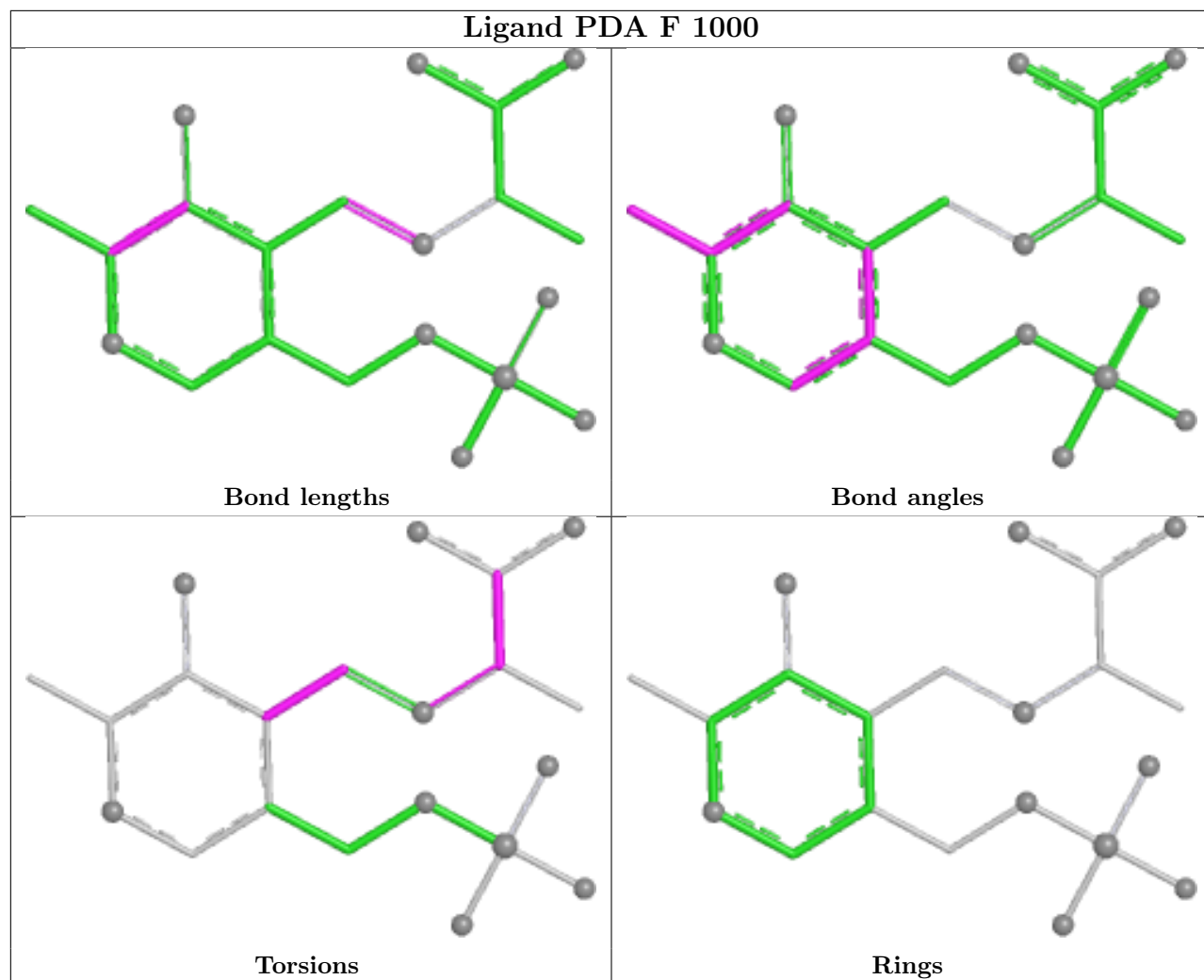


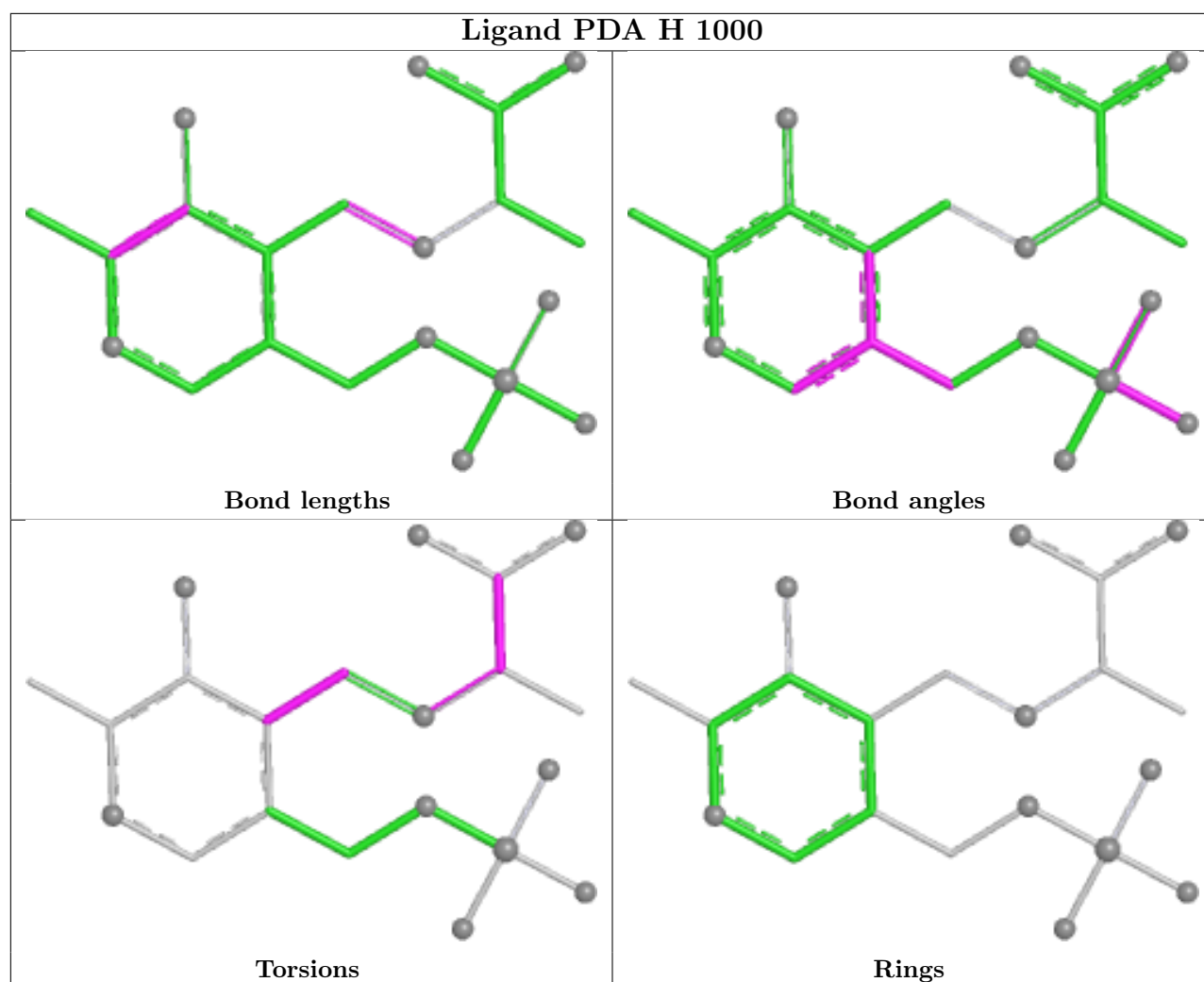


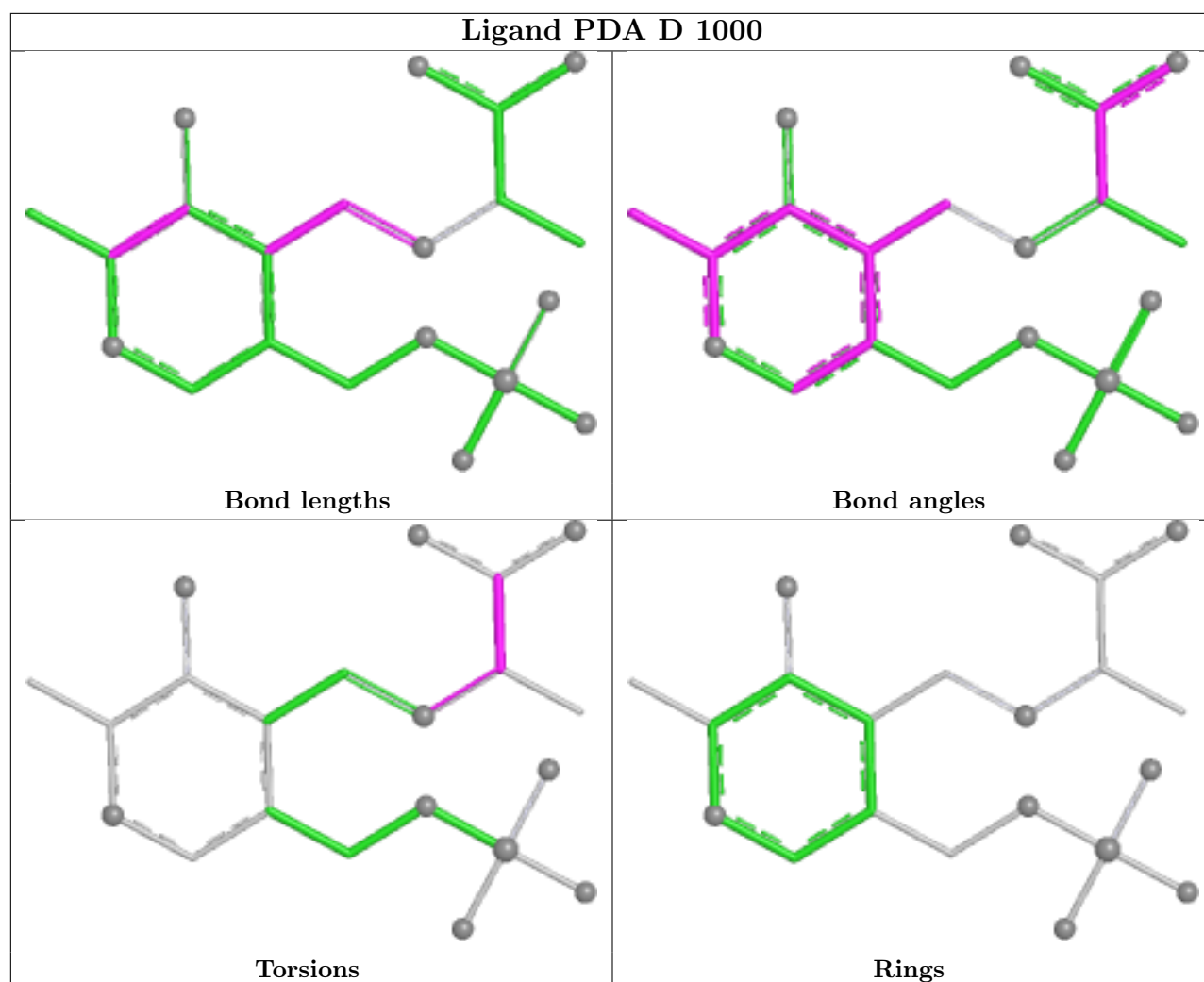


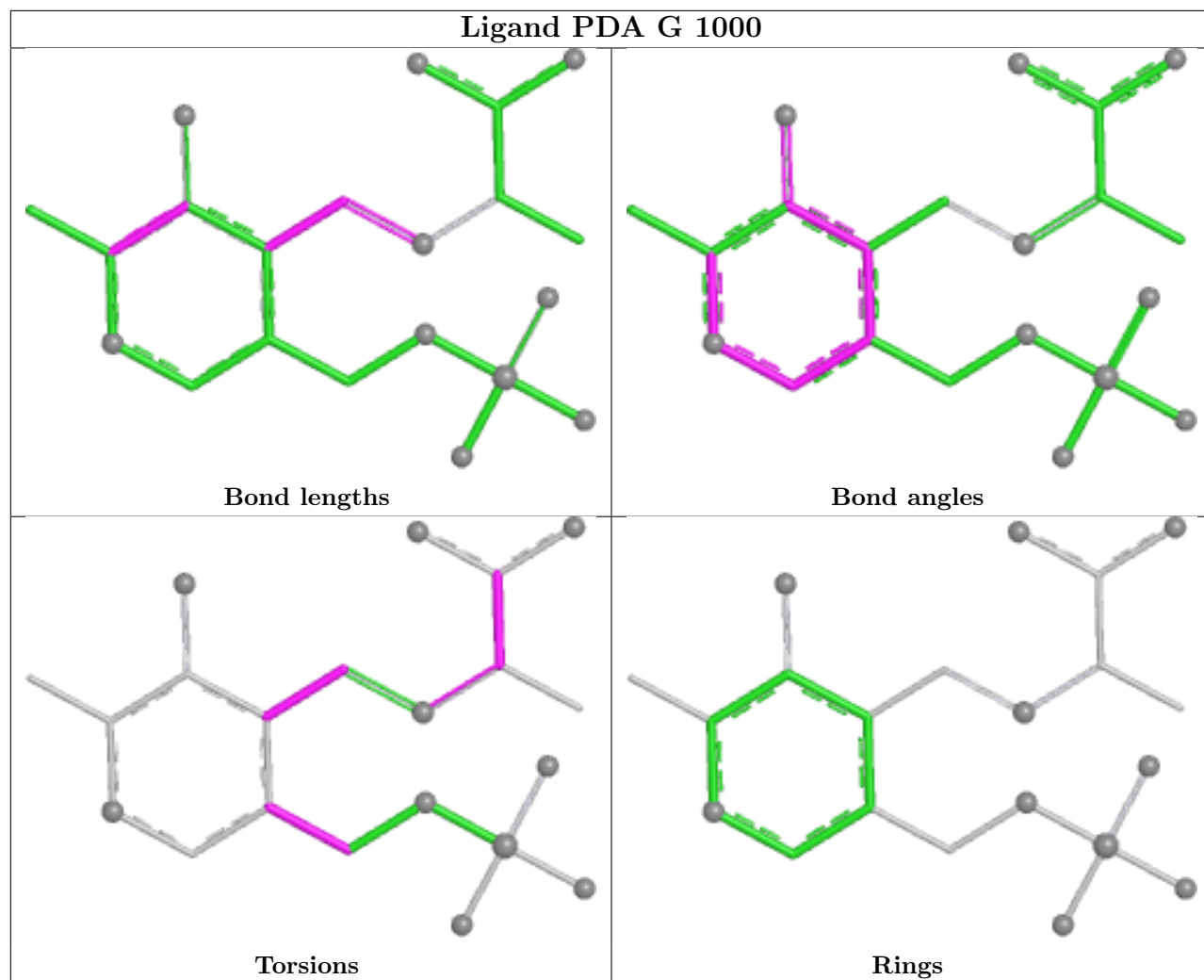


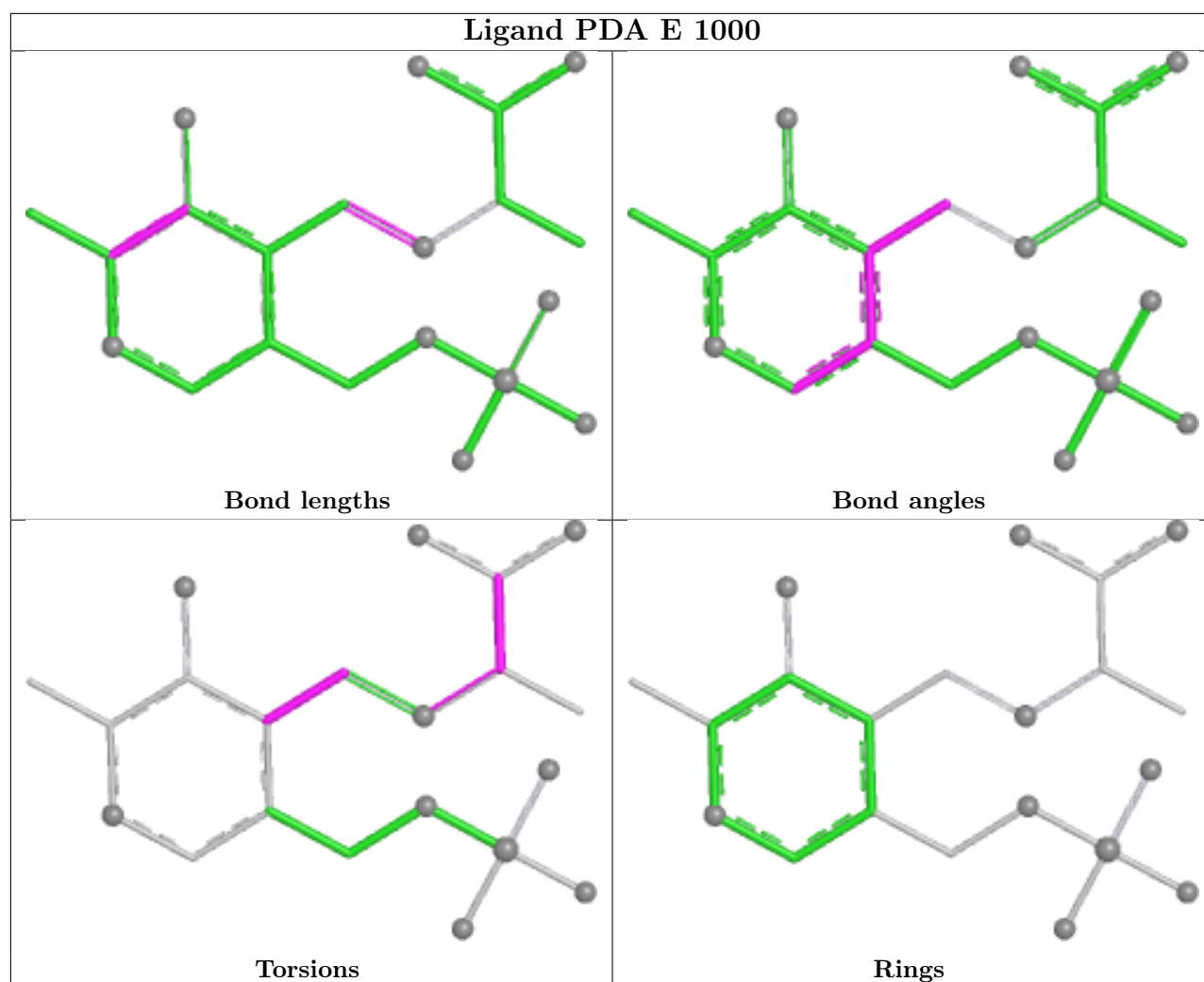


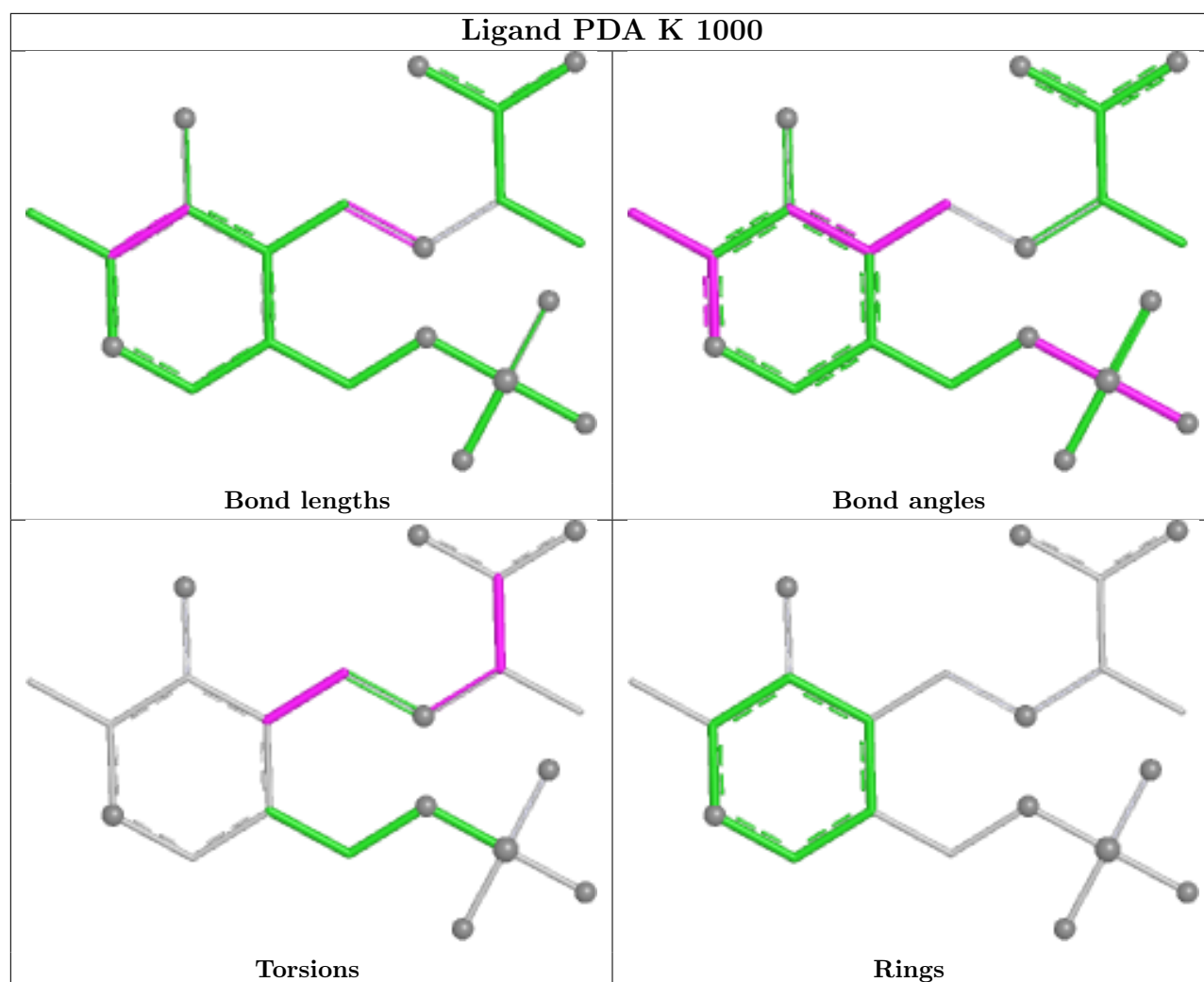


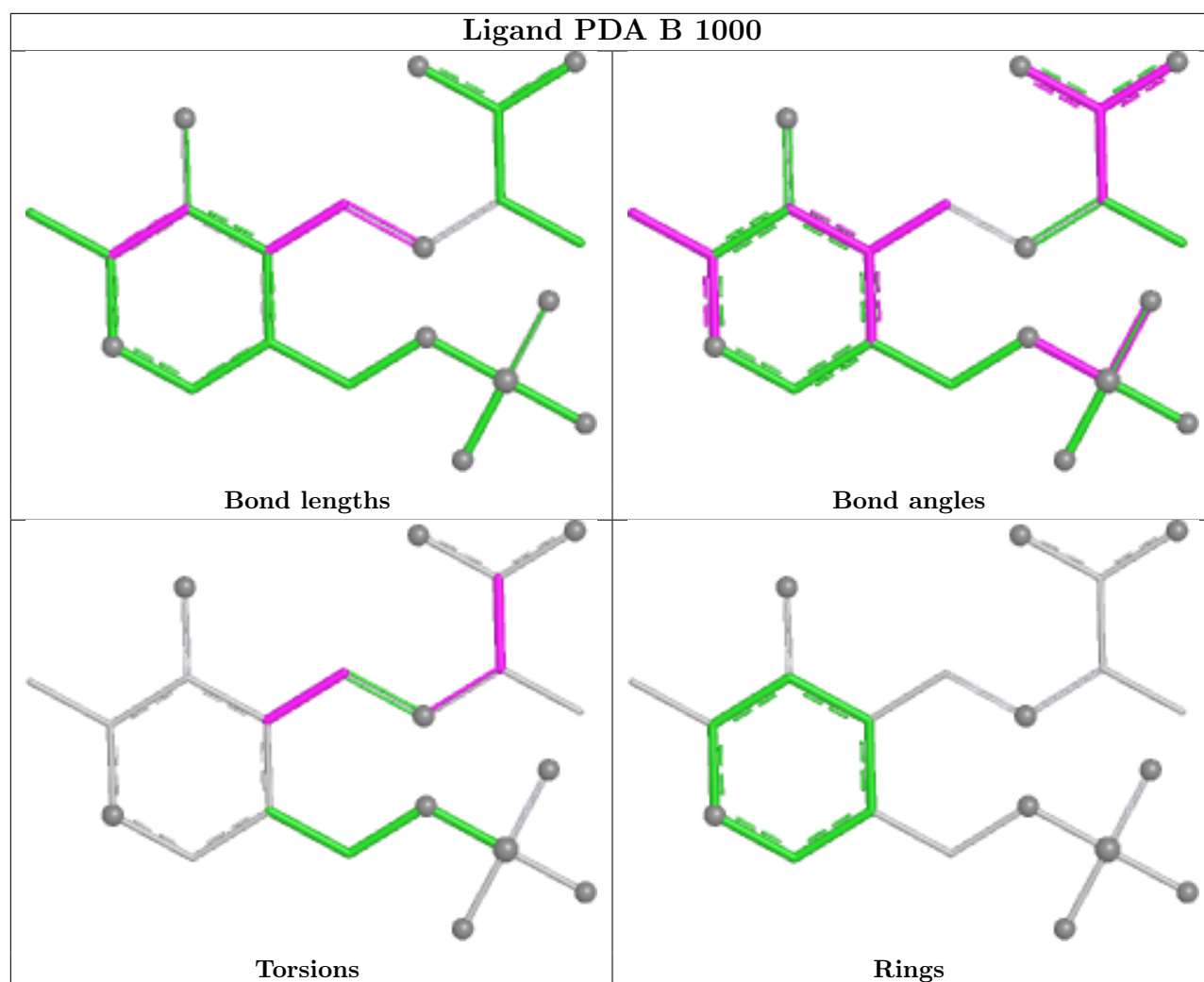












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

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	461/485 (95%)	-0.19	2 (0%) 88 89	45, 55, 75, 94	0
1	B	461/485 (95%)	-0.25	0 100 100	43, 56, 74, 97	0
1	C	461/485 (95%)	-0.01	1 (0%) 91 91	49, 63, 81, 96	0
1	D	465/485 (95%)	0.03	1 (0%) 91 91	48, 63, 84, 116	0
1	E	461/485 (95%)	0.18	0 100 100	53, 72, 91, 107	0
1	F	465/485 (95%)	0.14	1 (0%) 91 91	51, 68, 88, 114	0
1	G	459/485 (94%)	-0.01	1 (0%) 91 91	49, 64, 87, 118	0
1	H	462/485 (95%)	-0.05	1 (0%) 91 91	47, 61, 81, 98	0
1	I	461/485 (95%)	0.40	6 (1%) 75 76	52, 77, 101, 127	0
1	J	461/485 (95%)	0.78	22 (4%) 35 37	59, 86, 114, 133	0
1	K	461/485 (95%)	0.73	16 (3%) 47 49	57, 96, 136, 163	0
1	L	460/485 (94%)	0.91	30 (6%) 25 27	63, 110, 164, 185	0
All	All	5538/5820 (95%)	0.22	81 (1%) 72 73	43, 69, 119, 185	0

The worst 5 of 81 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	461	LEU	3.7
1	K	82	TYR	3.6
1	H	200	ASP	3.6
1	L	370	LEU	3.5
1	J	467	TYR	3.4

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

There are no oligosaccharides in this entry.

6.4 Ligands

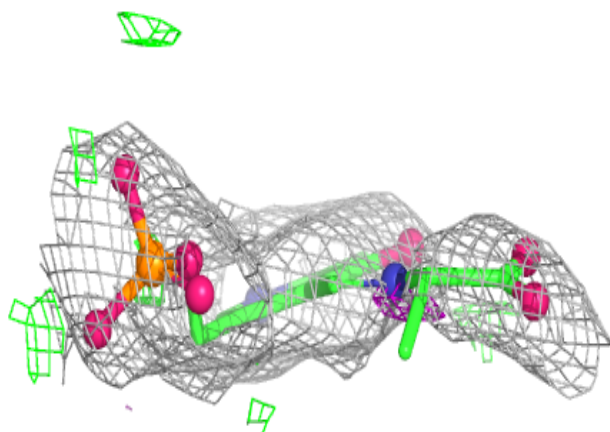
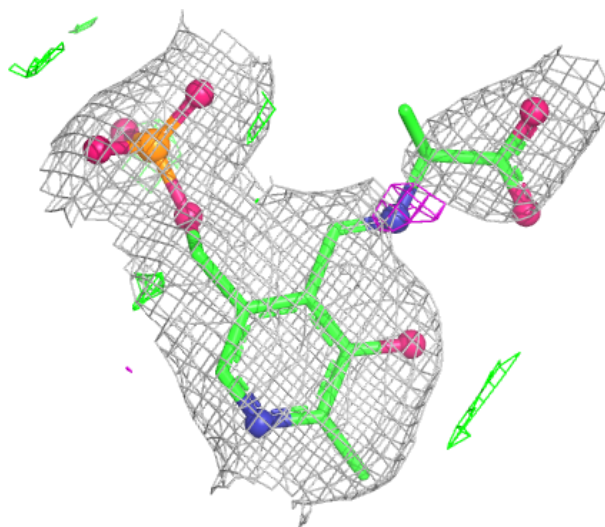
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	PDA	J	1000	21/21	0.92	0.12	68,74,89,92	0
2	PDA	K	1000	21/21	0.94	0.12	76,83,87,88	0
2	PDA	L	1000	21/21	0.94	0.11	90,94,117,121	0
2	PDA	E	1000	21/21	0.96	0.09	65,69,81,84	0
2	PDA	F	1000	21/21	0.96	0.10	60,63,89,92	0
2	PDA	I	1000	21/21	0.96	0.10	60,62,85,91	0
2	PDA	H	1000	21/21	0.97	0.08	48,55,72,76	0
2	PDA	D	1000	21/21	0.97	0.09	55,60,71,75	0
2	PDA	B	1000	21/21	0.97	0.08	47,55,65,69	0
2	PDA	C	1000	21/21	0.97	0.09	49,57,74,76	0
2	PDA	G	1000	21/21	0.97	0.07	53,60,77,79	0
2	PDA	A	1000	21/21	0.98	0.07	48,52,66,69	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.

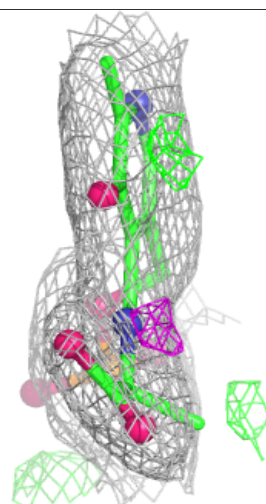
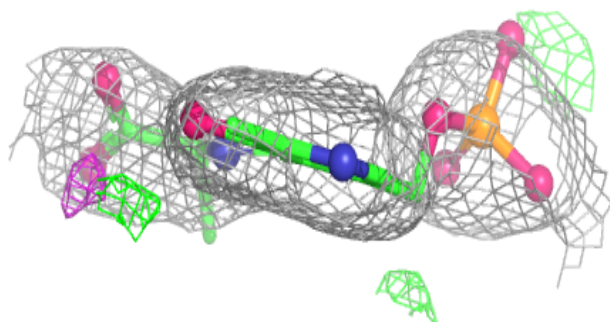
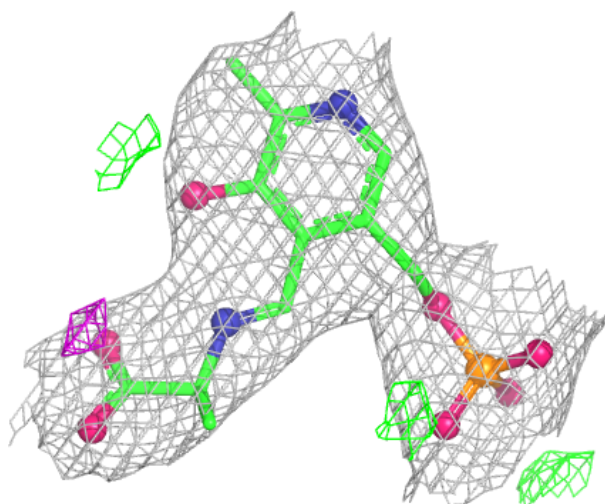
Electron density around PDA J 1000:

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



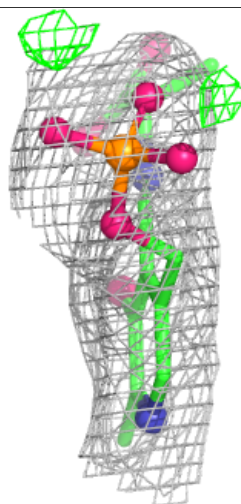
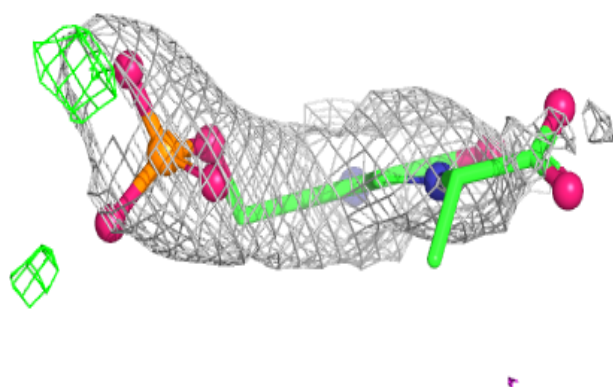
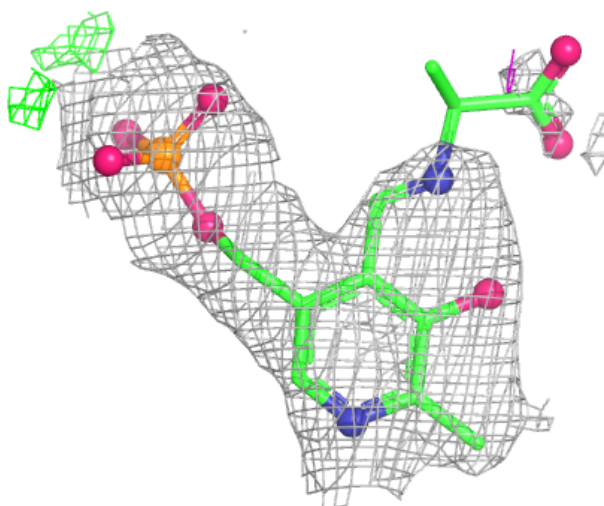
Electron density around PDA K 1000:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



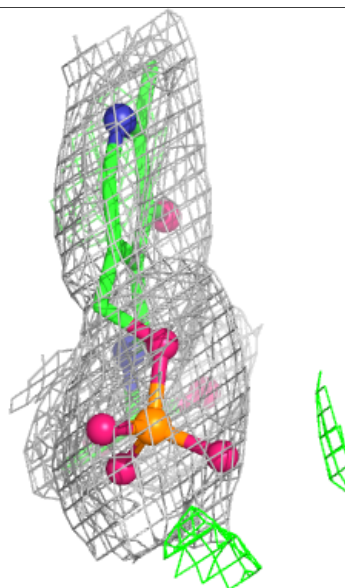
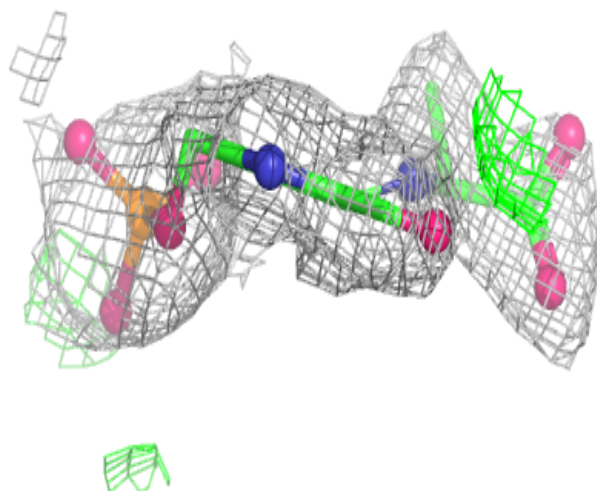
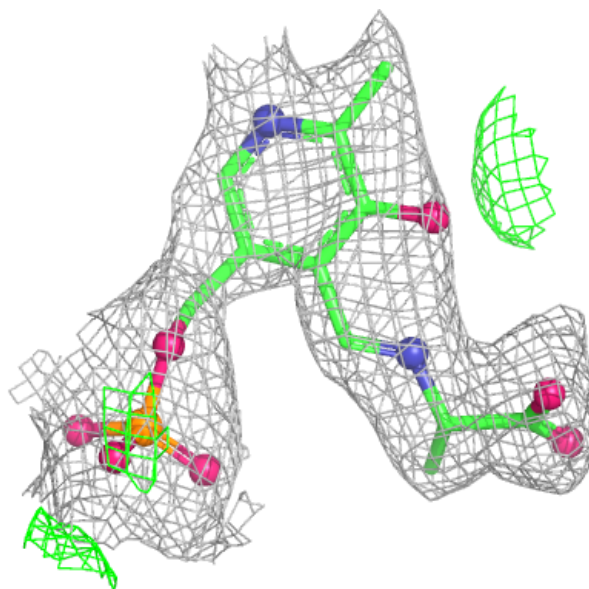
Electron density around PDA L 1000:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



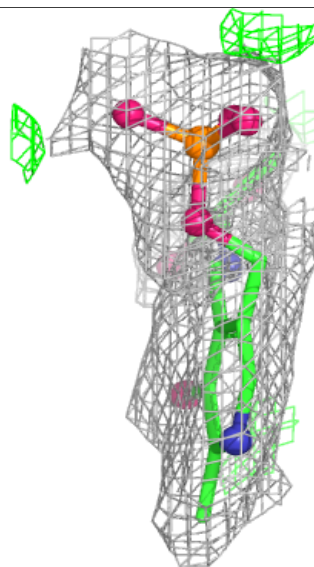
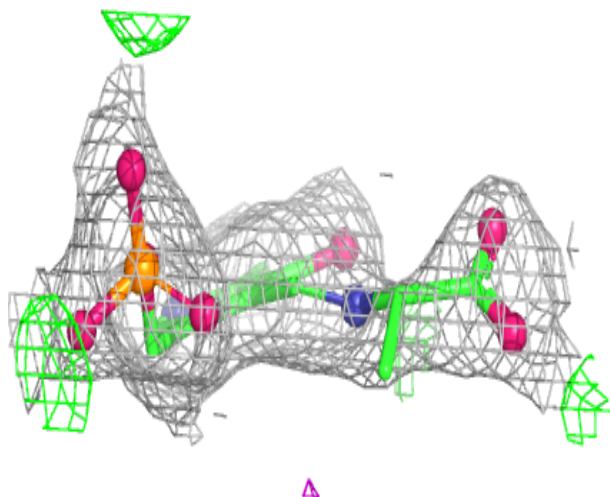
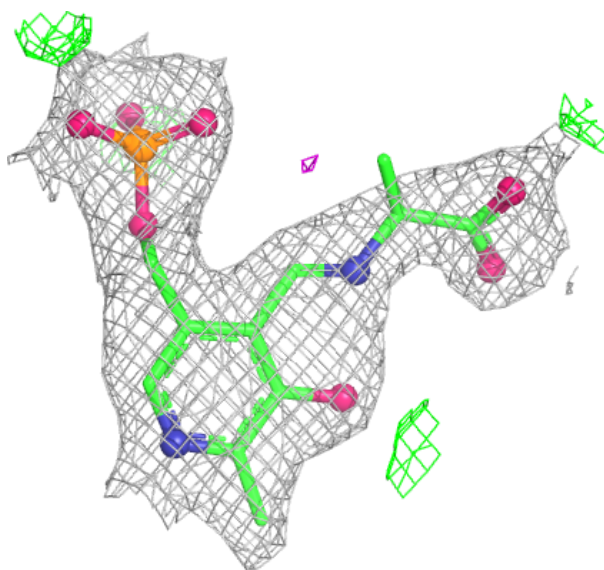
Electron density around PDA E 1000:

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



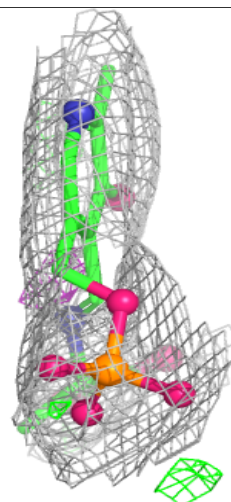
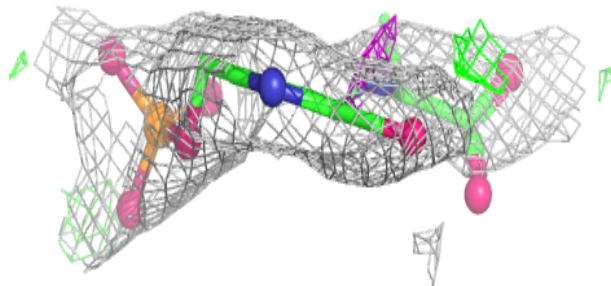
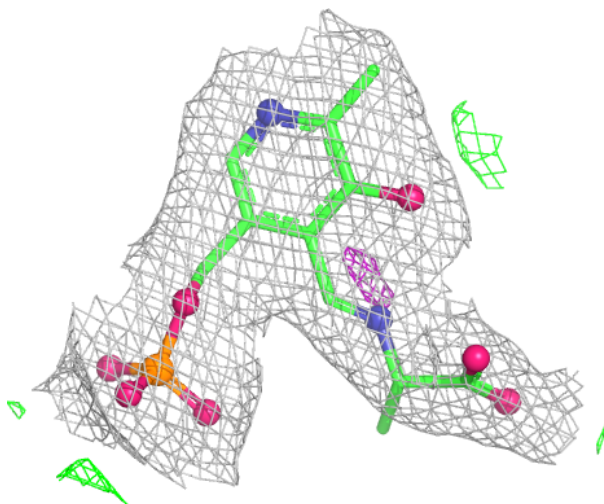
Electron density around PDA F 1000:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



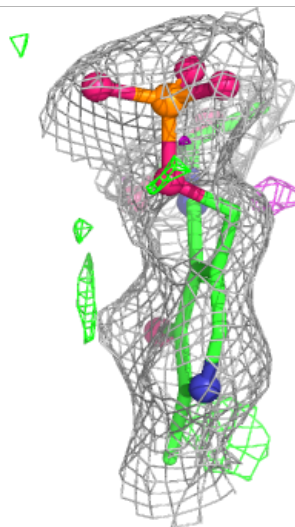
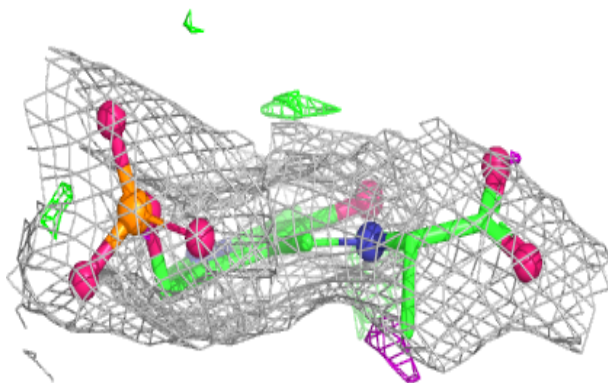
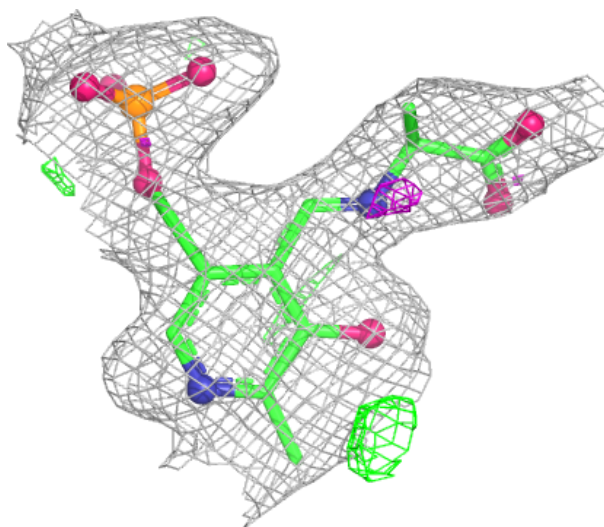
Electron density around PDA I 1000:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



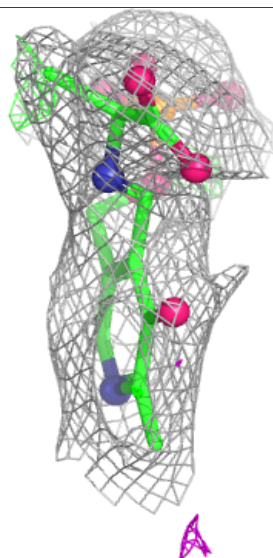
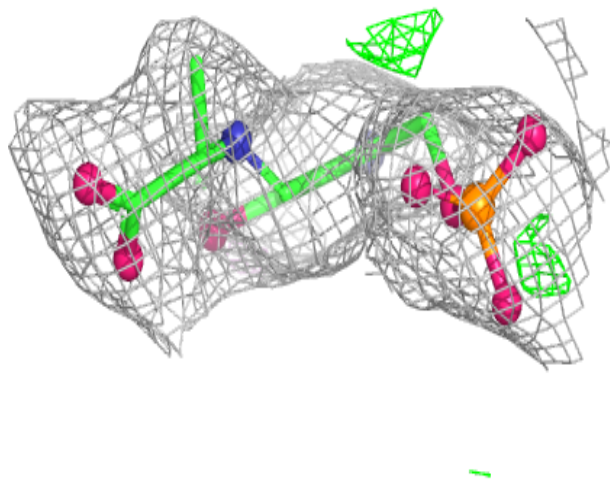
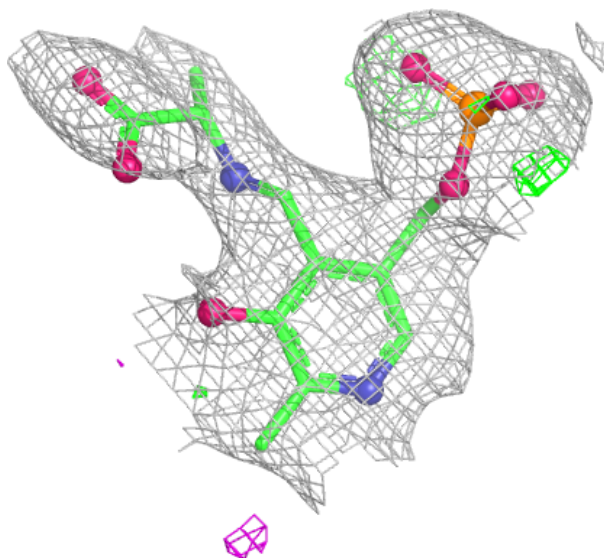
Electron density around PDA H 1000:

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and green (positive)



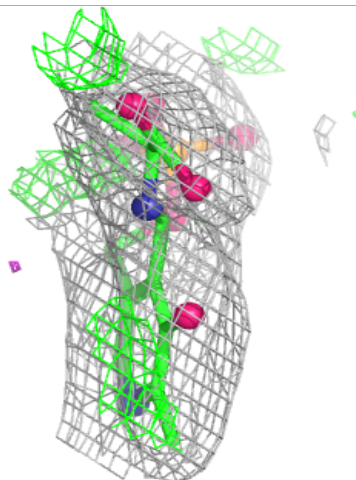
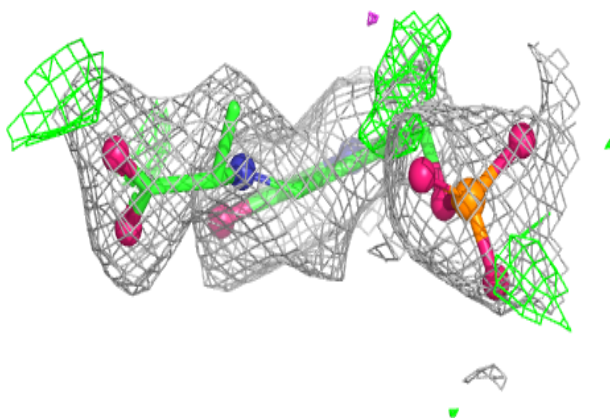
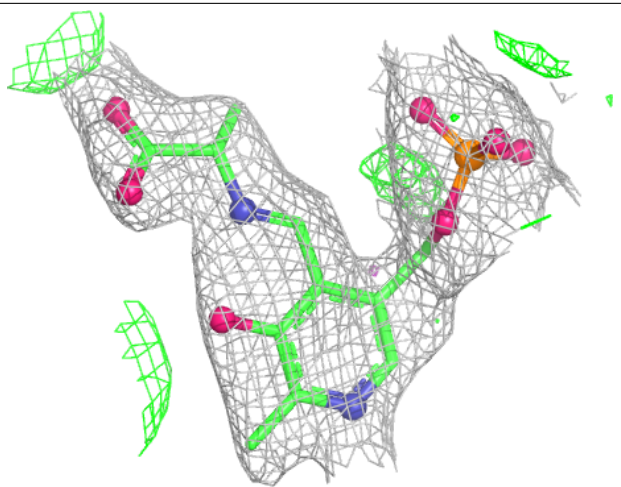
Electron density around PDA D 1000:

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and green (positive)



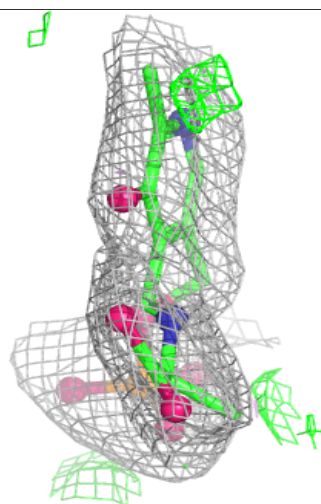
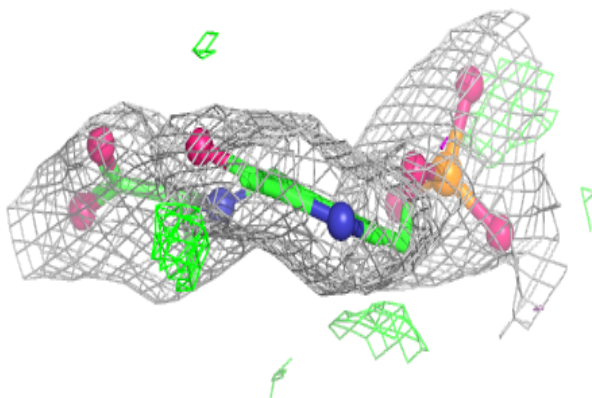
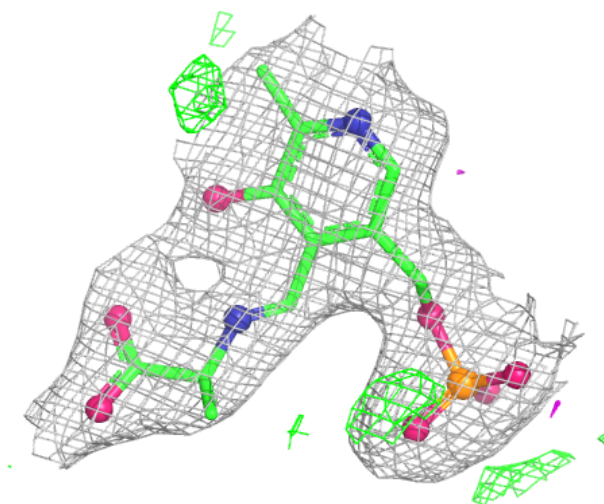
Electron density around PDA B 1000:

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and green (positive)



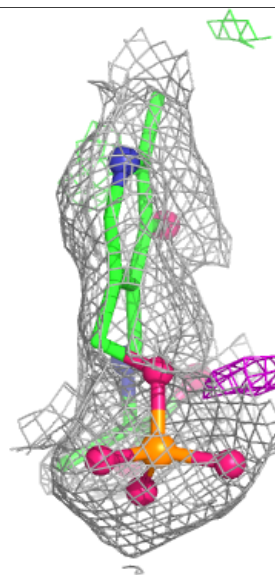
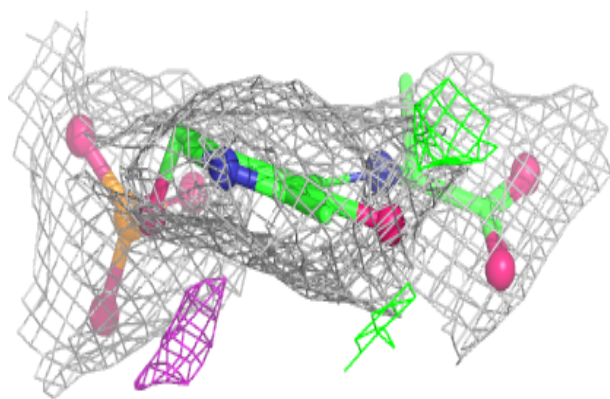
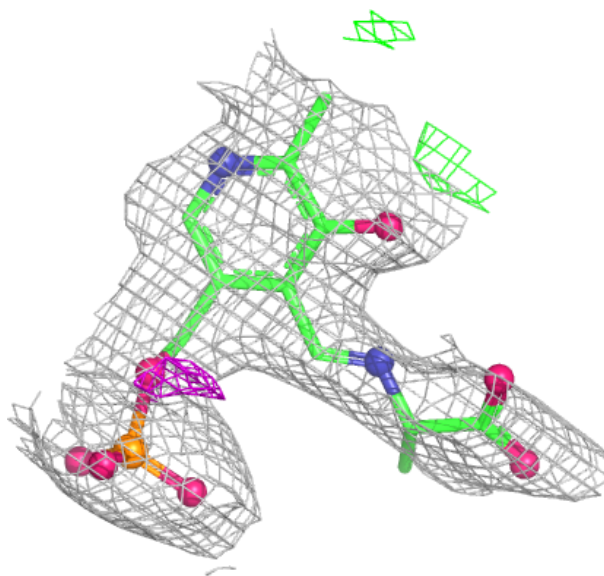
Electron density around PDA C 1000:

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and green (positive)



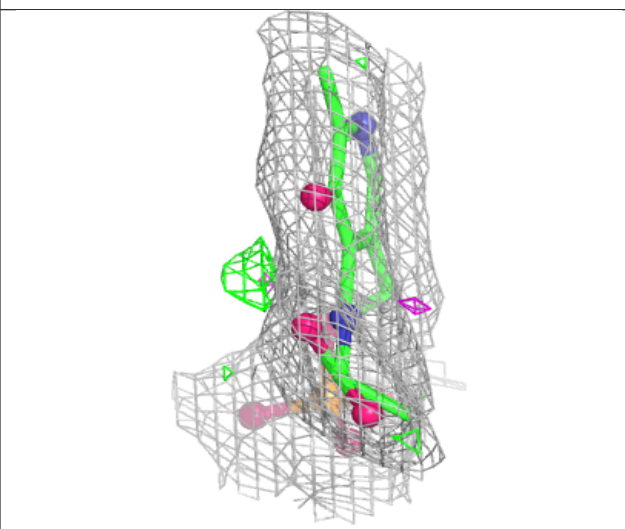
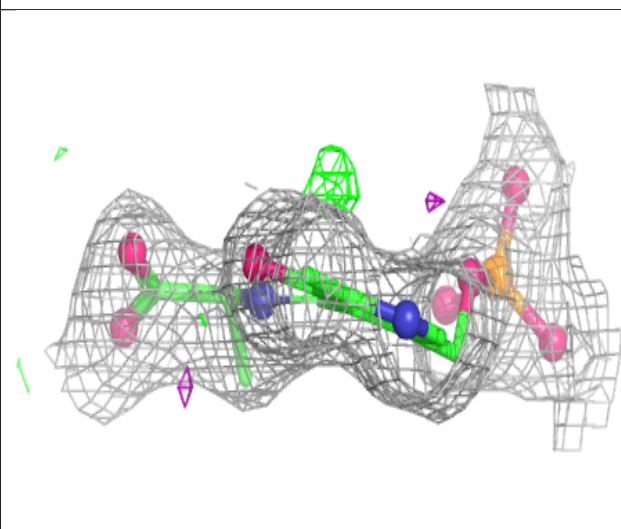
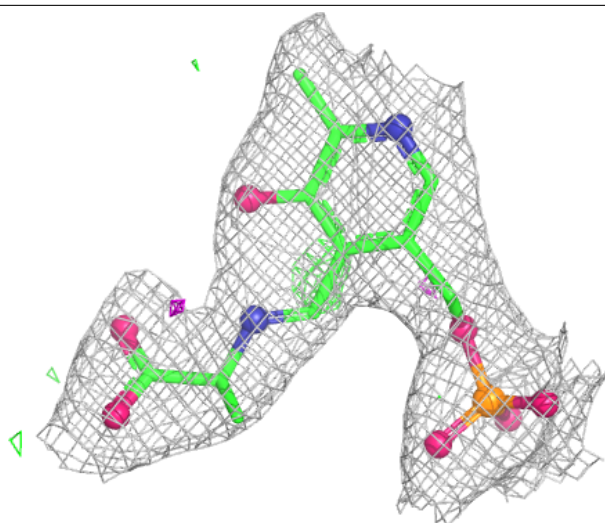
Electron density around PDA G 1000:

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



Electron density around PDA A 1000:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.