



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 22, 2026 – 02:16 AM UTC

PDB ID : 3A2C / pdb_00003a2c
Title : Crystal structure of a pyrazolopyrimidine inhibitor complex bound to MAP-KAP Kinase-2 (MK2)
Authors : Fujino, A.; Takimoto-Kamimura, M.
Deposited on : 2009-05-12
Resolution : 2.90 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:

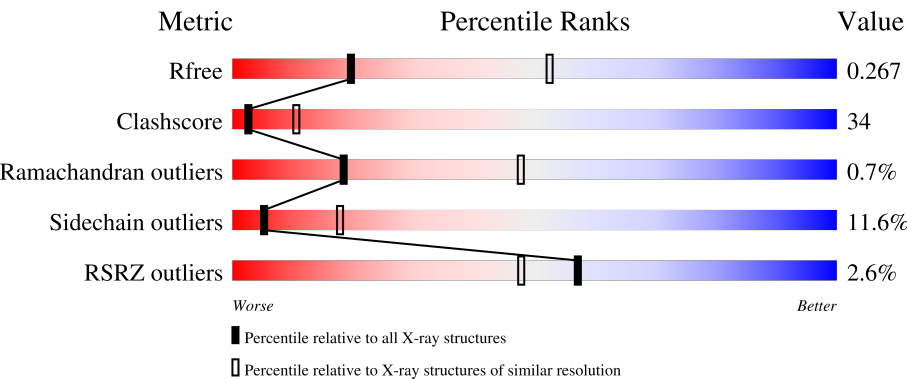
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 2.90 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}	180053	2481 (2.90-2.90)
Clashscore	190562	2690 (2.90-2.90)
Ramachandran outliers	187476	2623 (2.90-2.90)
Sidechain outliers	187428	2625 (2.90-2.90)
RSRZ outliers	180081	2481 (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 $\leq 5\%$. 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	324	<div><div></div><div>42%36%6%15%</div></div>
1	B	324	<div><div>2%</div><div>40%40%6%15%</div></div>
1	C	324	<div><div>2%</div><div>39%36%10%16%</div></div>
1	D	324	<div><div>2%</div><div>45%34%7%15%</div></div>
1	E	324	<div><div>2%</div><div>45%32%7%15%</div></div>

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Mol	Chain	Length	Quality of chain
1	F	324	
1	G	324	
1	H	324	
1	I	324	
1	J	324	
1	K	324	
1	L	324	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	PDY	C	2	-	-	X	-
2	PDY	E	1	-	-	X	-
2	PDY	E	2	-	-	X	-
2	PDY	F	2	-	-	X	-
2	PDY	G	1	-	-	X	-
2	PDY	G	2	-	-	X	-
2	PDY	H	1	-	-	X	-
2	PDY	H	2	-	-	X	-
2	PDY	I	1	-	-	X	-
2	PDY	I	2	-	-	X	-
2	PDY	J	1	-	-	X	-
2	PDY	K	1	-	-	X	-
2	PDY	K	2	-	-	X	-
2	PDY	L	1	-	-	X	-
2	PDY	L	2	-	-	X	-

2 Entry composition

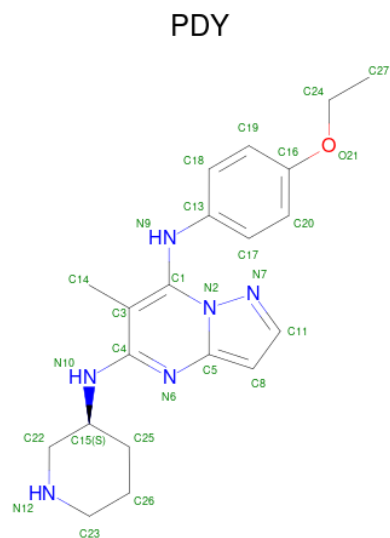
There are 3 unique types of molecules in this entry. The entry contains 27440 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MAP kinase-activated protein kinase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	274	Total	C	N	O	S	0	0	0
			2218	1415	384	402	17			
1	B	277	Total	C	N	O	S	0	0	0
			2240	1426	388	409	17			
1	C	273	Total	C	N	O	S	0	0	0
			2207	1409	380	401	17			
1	D	277	Total	C	N	O	S	0	0	0
			2244	1430	389	408	17			
1	E	276	Total	C	N	O	S	0	0	0
			2234	1425	385	407	17			
1	F	287	Total	C	N	O	S	0	0	0
			2316	1476	401	422	17			
1	G	273	Total	C	N	O	S	0	0	0
			2210	1411	381	401	17			
1	H	275	Total	C	N	O	S	0	0	0
			2226	1421	385	403	17			
1	I	275	Total	C	N	O	S	0	0	0
			2225	1420	384	404	17			
1	J	275	Total	C	N	O	S	0	0	0
			2225	1420	384	404	17			
1	K	273	Total	C	N	O	S	0	0	0
			2208	1409	381	401	17			
1	L	276	Total	C	N	O	S	0	0	0
			2234	1425	385	407	17			

- Molecule 2 is N 7 -(4-ethoxyphenyl)-6-methyl-N 5 -[(3S)-piperidin-3-yl]pyrazolo[1,5-a]pyrimidine-5,7-diamine (CCD ID: PDY) (formula: C₂₀H₂₆N₆O).



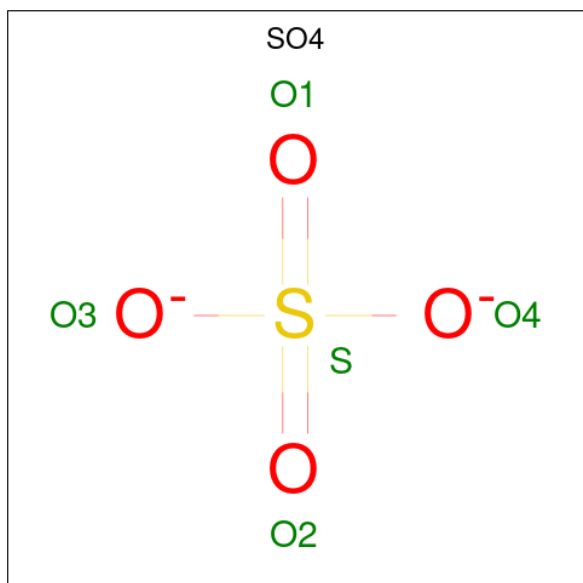
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 27	C 20	N 6	O 1	0	0
2	A	1	Total 27	C 20	N 6	O 1	0	0
2	B	1	Total 27	C 20	N 6	O 1	0	0
2	B	1	Total 27	C 20	N 6	O 1	0	0
2	C	1	Total 27	C 20	N 6	O 1	0	0
2	C	1	Total 27	C 20	N 6	O 1	0	0
2	D	1	Total 27	C 20	N 6	O 1	0	0
2	D	1	Total 27	C 20	N 6	O 1	0	0
2	E	1	Total 27	C 20	N 6	O 1	0	0
2	E	1	Total 27	C 20	N 6	O 1	0	0
2	F	1	Total 27	C 20	N 6	O 1	0	0
2	F	1	Total 27	C 20	N 6	O 1	0	0
2	G	1	Total 27	C 20	N 6	O 1	0	0
2	G	1	Total 27	C 20	N 6	O 1	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	H	1	Total	C	N	O	0	0
			27	20	6	1		
2	H	1	Total	C	N	O	0	0
			27	20	6	1		
2	I	1	Total	C	N	O	0	0
			27	20	6	1		
2	I	1	Total	C	N	O	0	0
			27	20	6	1		
2	J	1	Total	C	N	O	0	0
			27	20	6	1		
2	J	1	Total	C	N	O	0	0
			27	20	6	1		
2	K	1	Total	C	N	O	0	0
			27	20	6	1		
2	K	1	Total	C	N	O	0	0
			27	20	6	1		
2	L	1	Total	C	N	O	0	0
			27	20	6	1		
2	L	1	Total	C	N	O	0	0
			27	20	6	1		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).

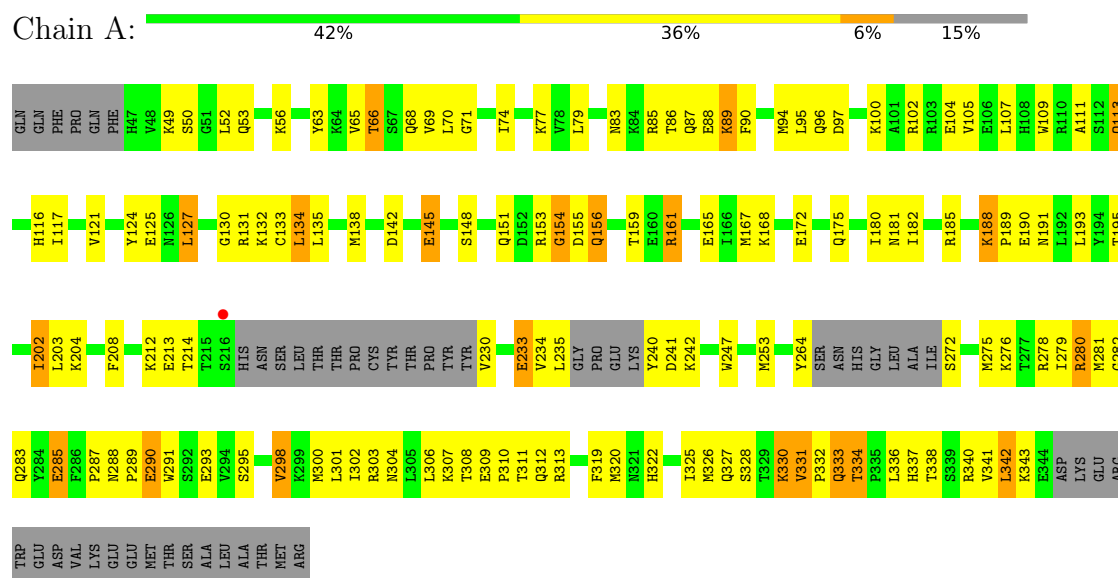


Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	F	1	Total	O S	0	0
			5	4 1		

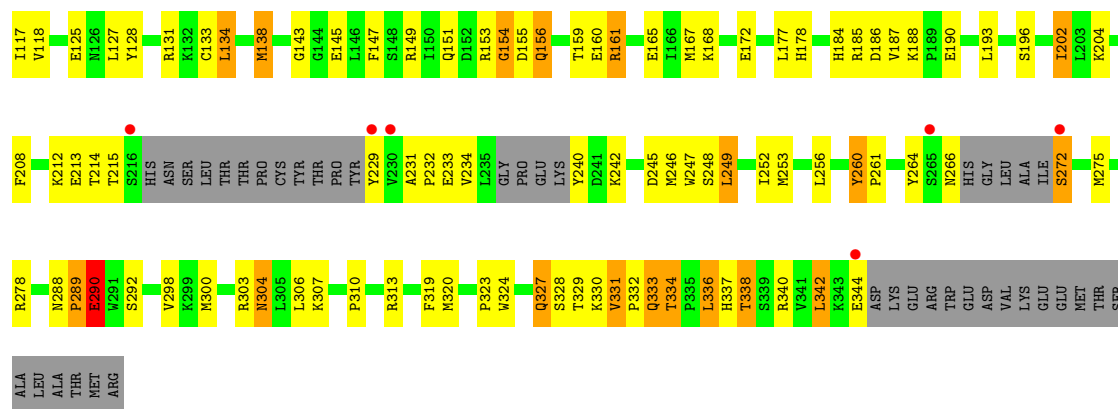
3 Residue-property plots

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.

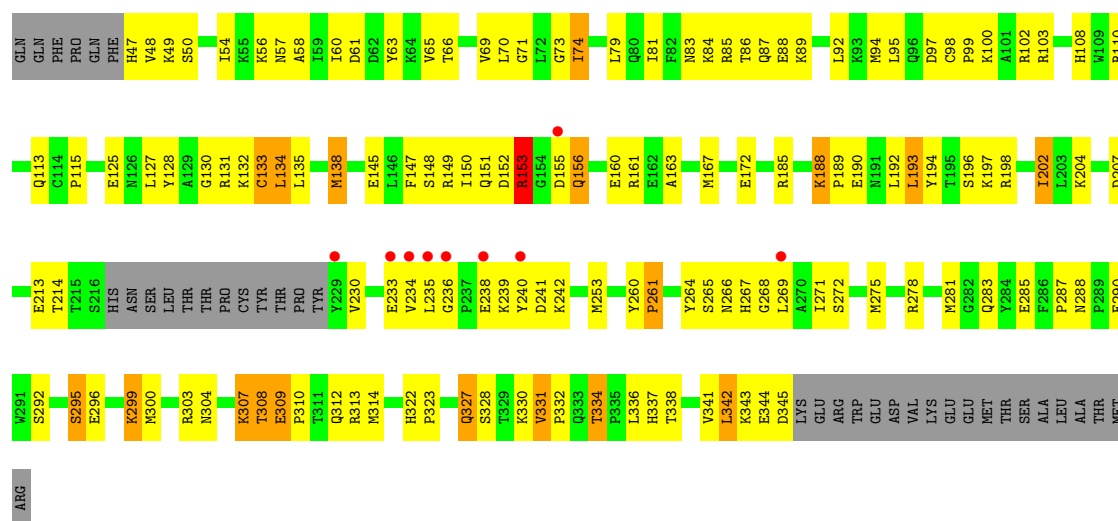
• Molecule 1: MAP kinase-activated protein kinase 2



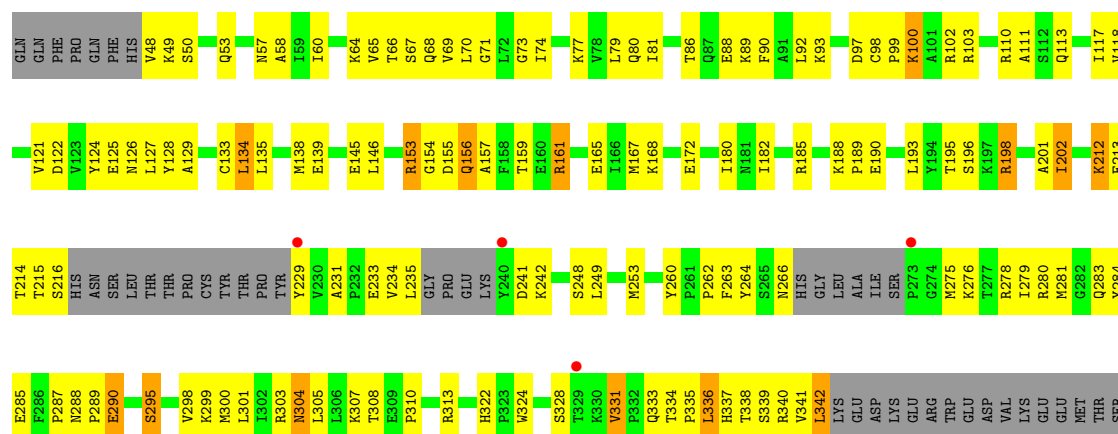
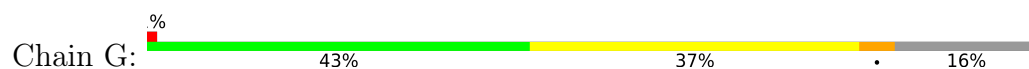




• Molecule 1: MAP kinase-activated protein kinase 2

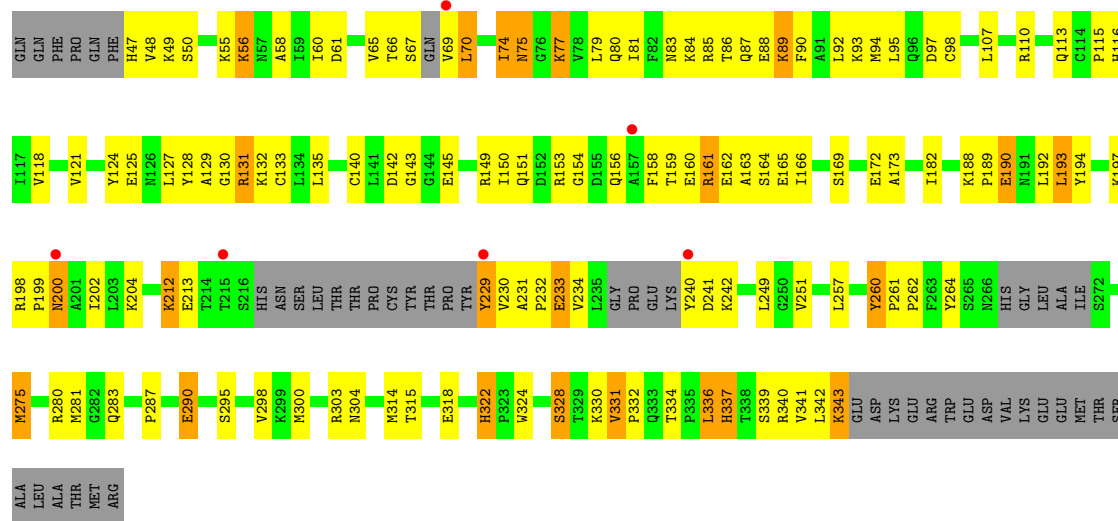
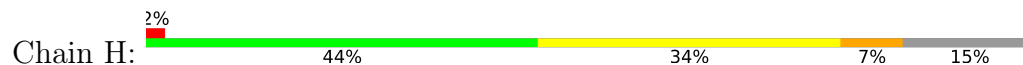


• Molecule 1: MAP kinase-activated protein kinase 2

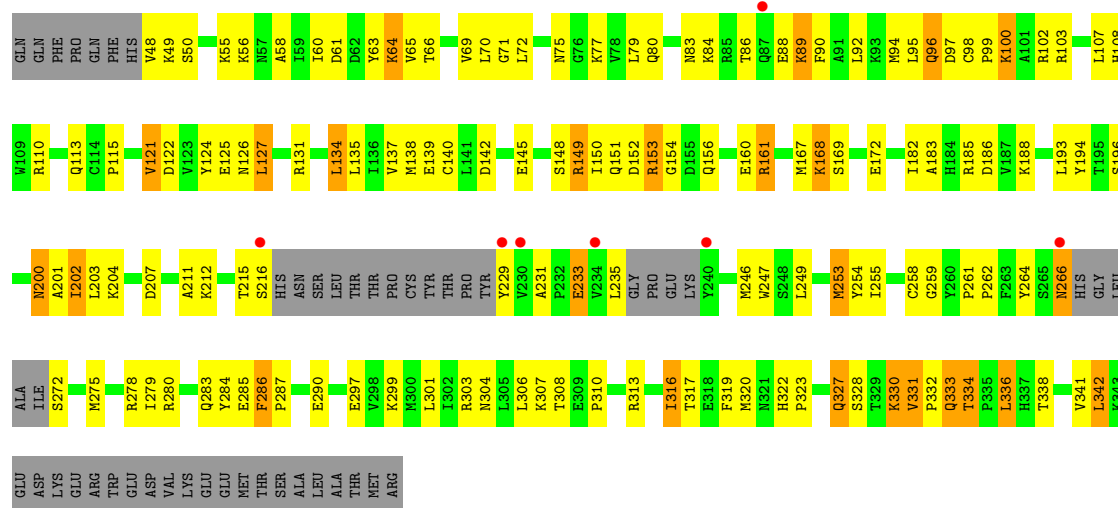


ALA
LEU
ALA
THR
MET
ARG

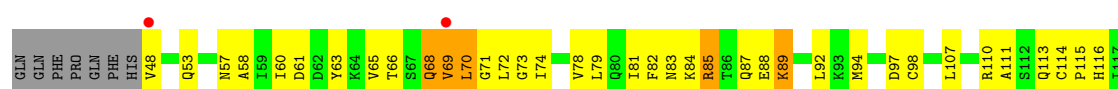
• Molecule 1: MAP kinase-activated protein kinase 2

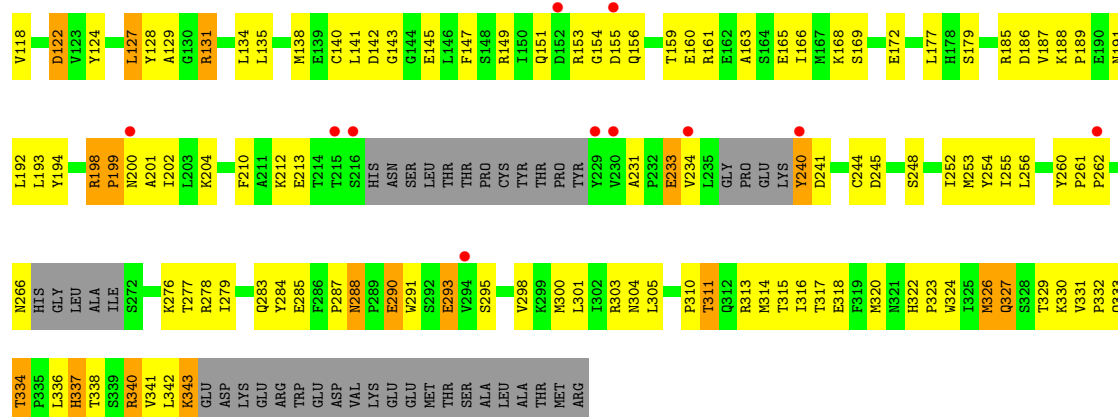


• Molecule 1: MAP kinase-activated protein kinase 2

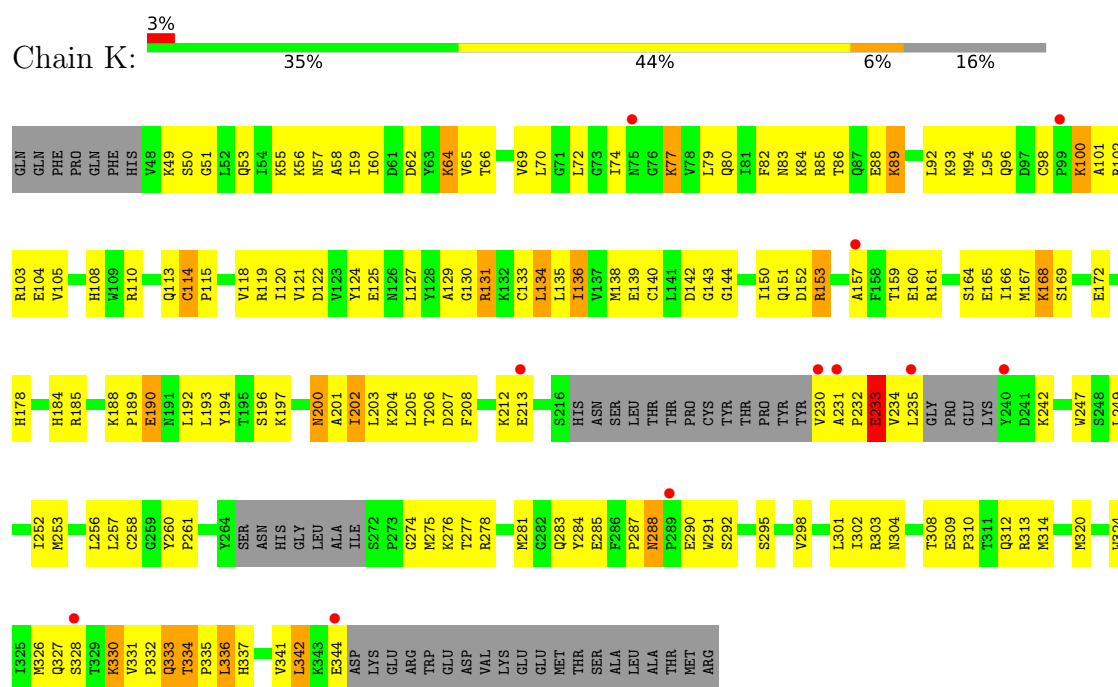


• Molecule 1: MAP kinase-activated protein kinase 2

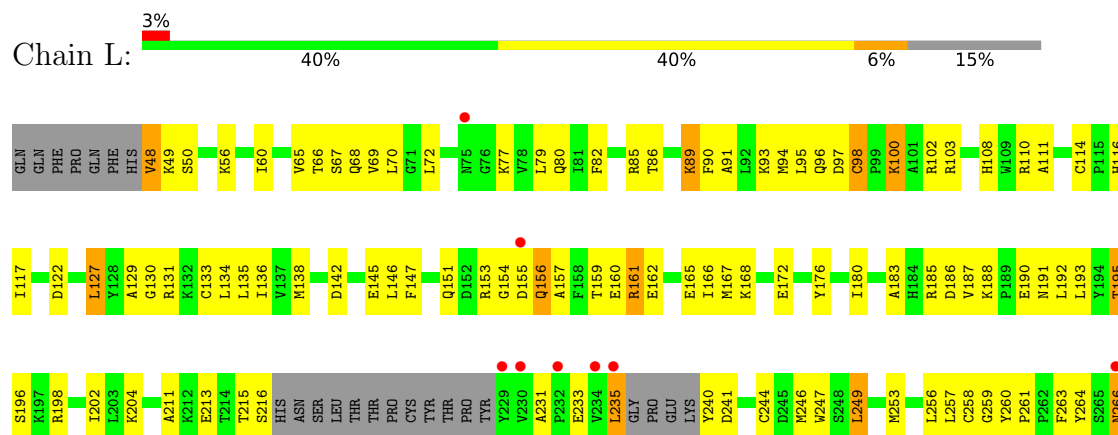


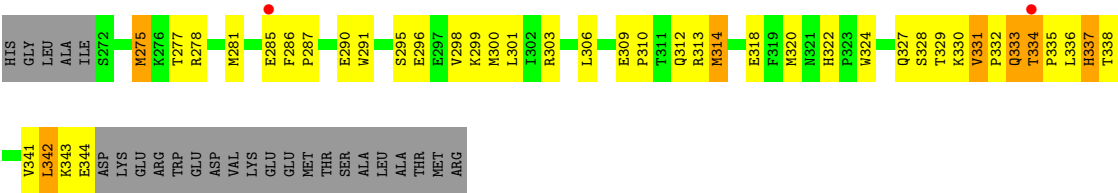


• Molecule 1: MAP kinase-activated protein kinase 2



• Molecule 1: MAP kinase-activated protein kinase 2





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	139.16Å 180.96Å 216.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.99 – 2.90 19.99 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.7 (19.99-2.90) 99.4 (19.99-2.90)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.84 (at 2.91Å)	Xtriage
Refinement program	CNX 2005	Depositor
R, R_{free}	0.288 , 0.335 0.213 , 0.267	Depositor DCC
R_{free} test set	6091 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	55.2	Xtriage
Anisotropy	0.012	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 61.7	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	0.92	EDS
Total number of atoms	27440	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.22% 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: PDY, SO4

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	0.54	0/2262	0.87	3/3048 (0.1%)
1	B	0.50	0/2284	0.85	2/3078 (0.1%)
1	C	0.46	0/2250	0.82	3/3032 (0.1%)
1	D	0.50	0/2288	0.82	2/3081 (0.1%)
1	E	0.52	0/2278	0.89	8/3070 (0.3%)
1	F	0.54	0/2365	0.88	6/3191 (0.2%)
1	G	0.47	0/2254	0.81	2/3038 (0.1%)
1	H	0.47	0/2270	0.86	7/3058 (0.2%)
1	I	0.51	0/2269	0.80	2/3058 (0.1%)
1	J	0.39	0/2269	0.75	0/3058
1	K	0.42	0/2251	0.80	3/3033 (0.1%)
1	L	0.41	0/2278	0.82	2/3070 (0.1%)
All	All	0.48	0/27318	0.83	40/36815 (0.1%)

There are no bond length outliers.

The worst 5 of 40 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	260	TYR	CA-C-N	8.05	125.45	119.66
1	C	260	TYR	C-N-CA	8.05	125.45	119.66
1	F	240	TYR	N-CA-C	7.11	119.21	109.11
1	C	296	GLU	N-CA-C	-6.72	105.23	113.50
1	B	331	VAL	CA-C-N	6.52	126.50	119.78

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	2218	0	2255	143	0
1	B	2240	0	2270	159	0
1	C	2207	0	2240	165	0
1	D	2244	0	2281	122	0
1	E	2234	0	2268	138	0
1	F	2316	0	2347	132	0
1	G	2210	0	2245	132	0
1	H	2226	0	2260	165	0
1	I	2225	0	2262	155	0
1	J	2225	0	2262	180	0
1	K	2208	0	2248	169	0
1	L	2234	0	2268	163	0
2	A	54	0	52	8	0
2	B	54	0	52	15	0
2	C	54	0	52	17	0
2	D	54	0	52	13	0
2	E	54	0	52	23	0
2	F	54	0	52	15	0
2	G	54	0	52	20	0
2	H	54	0	51	40	0
2	I	54	0	52	37	0
2	J	54	0	52	16	0
2	K	54	0	52	25	0
2	L	54	0	52	22	0
3	F	5	0	0	1	0
All	All	27440	0	27829	1879	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 34.

The worst 5 of 1879 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:L:2:PDY:H18	2:L:2:PDY:C14	1.53	1.38
1:H:264:TYR:CZ	2:H:2:PDY:H20	1.61	1.32

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:264:TYR:CG	2:I:2:PDY:H17	1.65	1.32
2:D:2:PDY:H18	2:D:2:PDY:C14	1.60	1.29
2:J:1:PDY:C14	2:J:1:PDY:H18	1.60	1.29

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	266/324 (82%)	251 (94%)	14 (5%)	1 (0%)	30	59
1	B	269/324 (83%)	252 (94%)	15 (6%)	2 (1%)	18	48
1	C	263/324 (81%)	237 (90%)	21 (8%)	5 (2%)	6	23
1	D	269/324 (83%)	249 (93%)	19 (7%)	1 (0%)	30	59
1	E	268/324 (83%)	249 (93%)	16 (6%)	3 (1%)	11	36
1	F	283/324 (87%)	262 (93%)	19 (7%)	2 (1%)	18	48
1	G	265/324 (82%)	240 (91%)	24 (9%)	1 (0%)	30	59
1	H	265/324 (82%)	242 (91%)	23 (9%)	0	100	100
1	I	267/324 (82%)	251 (94%)	16 (6%)	0	100	100
1	J	267/324 (82%)	231 (86%)	34 (13%)	2 (1%)	18	48
1	K	265/324 (82%)	238 (90%)	24 (9%)	3 (1%)	11	36
1	L	268/324 (83%)	241 (90%)	24 (9%)	3 (1%)	11	36
All	All	3215/3888 (83%)	2943 (92%)	249 (8%)	23 (1%)	18	48

5 of 23 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	154	GLY
1	A	154	GLY

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Mol	Chain	Res	Type
1	C	328	SER
1	G	295	SER
1	L	156	GLN

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	248/293 (85%)	212 (86%)	36 (14%)	3	10
1	B	251/293 (86%)	225 (90%)	26 (10%)	7	23
1	C	247/293 (84%)	214 (87%)	33 (13%)	4	12
1	D	251/293 (86%)	217 (86%)	34 (14%)	4	12
1	E	250/293 (85%)	221 (88%)	29 (12%)	5	18
1	F	258/293 (88%)	228 (88%)	30 (12%)	5	18
1	G	247/293 (84%)	223 (90%)	24 (10%)	8	25
1	H	249/293 (85%)	222 (89%)	27 (11%)	6	21
1	I	249/293 (85%)	219 (88%)	30 (12%)	5	16
1	J	249/293 (85%)	219 (88%)	30 (12%)	5	16
1	K	247/293 (84%)	219 (89%)	28 (11%)	5	19
1	L	250/293 (85%)	228 (91%)	22 (9%)	9	29
All	All	2996/3516 (85%)	2647 (88%)	349 (12%)	5	18

5 of 349 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	249	LEU
1	J	277	THR
1	H	343	LYS
1	I	308	THR
1	K	64	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 131

such sidechains are listed below:

Mol	Chain	Res	Type
1	K	116	HIS
1	K	327	GLN
1	L	333	GLN
1	E	156	GLN
1	E	151	GLN

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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

25 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	PDY	E	1	-	29,30,30	2.65	5 (17%)	28,41,41	2.97	8 (28%)
2	PDY	I	2	-	29,30,30	2.61	6 (20%)	28,41,41	3.12	15 (53%)
2	PDY	L	1	-	29,30,30	2.66	5 (17%)	28,41,41	3.07	7 (25%)
3	SO4	F	3	-	4,4,4	0.34	0	6,6,6	0.14	0
2	PDY	J	2	-	29,30,30	2.65	5 (17%)	28,41,41	2.88	6 (21%)
2	PDY	C	2	-	29,30,30	2.64	6 (20%)	28,41,41	2.93	4 (14%)
2	PDY	F	1	-	29,30,30	2.65	5 (17%)	28,41,41	3.11	8 (28%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PDY	G	2	-	29,30,30	2.64	6 (20%)	28,41,41	2.86	6 (21%)
2	PDY	J	1	-	29,30,30	2.65	5 (17%)	28,41,41	2.81	6 (21%)
2	PDY	K	2	-	29,30,30	2.64	6 (20%)	28,41,41	3.02	8 (28%)
2	PDY	A	2	-	29,30,30	2.64	5 (17%)	28,41,41	2.82	7 (25%)
2	PDY	L	2	-	29,30,30	2.62	5 (17%)	28,41,41	2.65	7 (25%)
2	PDY	E	2	-	29,30,30	2.64	6 (20%)	28,41,41	2.93	6 (21%)
2	PDY	K	1	-	29,30,30	2.64	5 (17%)	28,41,41	2.92	7 (25%)
2	PDY	F	2	-	29,30,30	2.66	5 (17%)	28,41,41	3.02	7 (25%)
2	PDY	C	1	-	29,30,30	2.65	5 (17%)	28,41,41	3.06	8 (28%)
2	PDY	B	2	-	29,30,30	2.66	6 (20%)	28,41,41	3.03	6 (21%)
2	PDY	D	1	-	29,30,30	2.66	5 (17%)	28,41,41	3.01	7 (25%)
2	PDY	B	1	-	29,30,30	2.65	5 (17%)	28,41,41	3.03	5 (17%)
2	PDY	I	1	-	29,30,30	2.65	5 (17%)	28,41,41	3.04	6 (21%)
2	PDY	H	2	-	29,30,30	2.68	6 (20%)	28,41,41	3.35	14 (50%)
2	PDY	G	1	-	29,30,30	2.66	6 (20%)	28,41,41	3.05	7 (25%)
2	PDY	D	2	-	29,30,30	2.61	5 (17%)	28,41,41	2.69	5 (17%)
2	PDY	H	1	-	29,30,30	2.67	6 (20%)	28,41,41	3.11	8 (28%)
2	PDY	A	1	-	29,30,30	2.66	5 (17%)	28,41,41	3.07	7 (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
2	PDY	E	1	-	-	5/11/19/19	0/4/4/4
2	PDY	I	2	-	-	2/11/19/19	0/4/4/4
2	PDY	L	1	-	-	5/11/19/19	0/4/4/4
2	PDY	J	2	-	-	4/11/19/19	0/4/4/4
2	PDY	C	2	-	-	4/11/19/19	0/4/4/4
2	PDY	F	1	-	-	5/11/19/19	0/4/4/4
2	PDY	G	2	-	-	4/11/19/19	0/4/4/4
2	PDY	J	1	-	-	2/11/19/19	0/4/4/4
2	PDY	K	2	-	-	5/11/19/19	0/4/4/4
2	PDY	A	2	-	-	4/11/19/19	0/4/4/4
2	PDY	L	2	-	-	2/11/19/19	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PDY	E	2	-	-	4/11/19/19	0/4/4/4
2	PDY	K	1	-	-	3/11/19/19	0/4/4/4
2	PDY	F	2	-	-	4/11/19/19	0/4/4/4
2	PDY	C	1	-	-	2/11/19/19	0/4/4/4
2	PDY	B	2	-	-	4/11/19/19	0/4/4/4
2	PDY	D	1	-	-	3/11/19/19	0/4/4/4
2	PDY	B	1	-	-	2/11/19/19	0/4/4/4
2	PDY	I	1	-	-	2/11/19/19	0/4/4/4
2	PDY	H	2	-	-	1/11/19/19	0/4/4/4
2	PDY	G	1	-	-	5/11/19/19	0/4/4/4
2	PDY	D	2	-	-	3/11/19/19	0/4/4/4
2	PDY	H	1	-	-	3/11/19/19	0/4/4/4
2	PDY	A	1	-	-	4/11/19/19	0/4/4/4

The worst 5 of 129 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	2	PDY	N2-N7	-8.83	1.23	1.37
2	H	2	PDY	N2-N7	-8.73	1.23	1.37
2	D	1	PDY	N2-N7	-8.69	1.23	1.37
2	F	2	PDY	N2-N7	-8.68	1.23	1.37
2	B	2	PDY	N2-N7	-8.66	1.23	1.37

The worst 5 of 175 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1	PDY	C11-N7-N2	11.60	112.20	103.26
2	C	2	PDY	C11-N7-N2	11.51	112.12	103.26
2	A	1	PDY	C11-N7-N2	11.49	112.11	103.26
2	D	1	PDY	C11-N7-N2	11.33	111.98	103.26
2	F	1	PDY	C11-N7-N2	11.30	111.97	103.26

There are no chirality outliers.

5 of 82 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	1	PDY	N2-C1-N9-C13
2	E	1	PDY	N2-C1-N9-C13
2	G	1	PDY	N2-C1-N9-C13

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Mol	Chain	Res	Type	Atoms
2	H	1	PDY	N2-C1-N9-C13
2	H	2	PDY	C3-C1-N9-C13

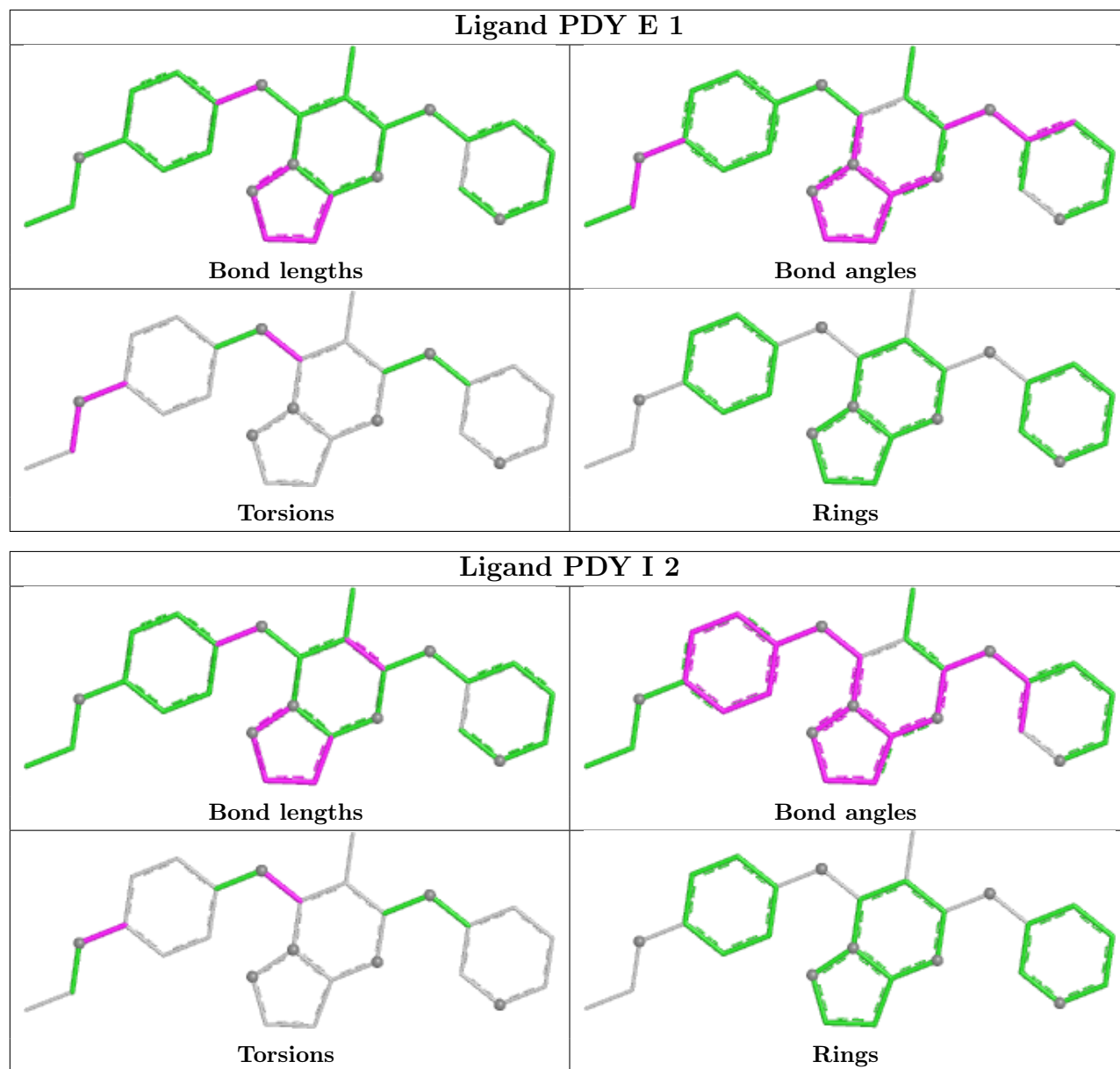
There are no ring outliers.

25 monomers are involved in 252 short contacts:

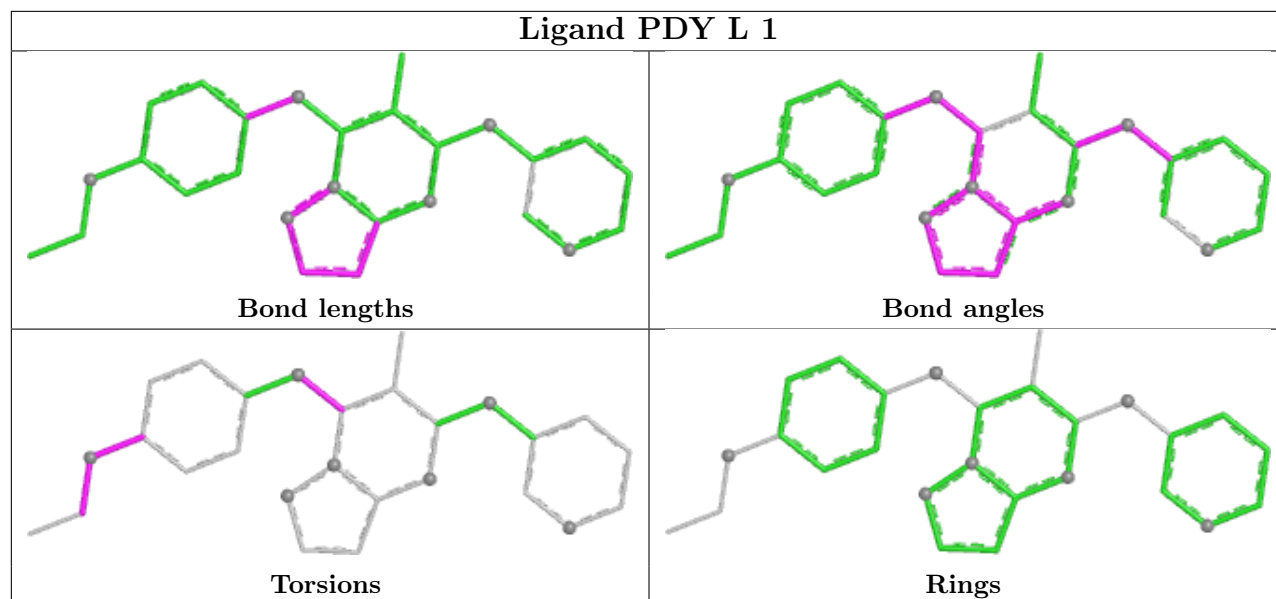
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	1	PDY	12	0
2	I	2	PDY	26	0
2	L	1	PDY	9	0
3	F	3	SO4	1	0
2	J	2	PDY	7	0
2	C	2	PDY	11	0
2	F	1	PDY	5	0
2	G	2	PDY	10	0
2	J	1	PDY	9	0
2	K	2	PDY	11	0
2	A	2	PDY	4	0
2	L	2	PDY	13	0
2	E	2	PDY	11	0
2	K	1	PDY	14	0
2	F	2	PDY	10	0
2	C	1	PDY	6	0
2	B	2	PDY	7	0
2	D	1	PDY	7	0
2	B	1	PDY	8	0
2	I	1	PDY	11	0
2	H	2	PDY	27	0
2	G	1	PDY	10	0
2	D	2	PDY	6	0
2	H	1	PDY	13	0
2	A	1	PDY	4	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

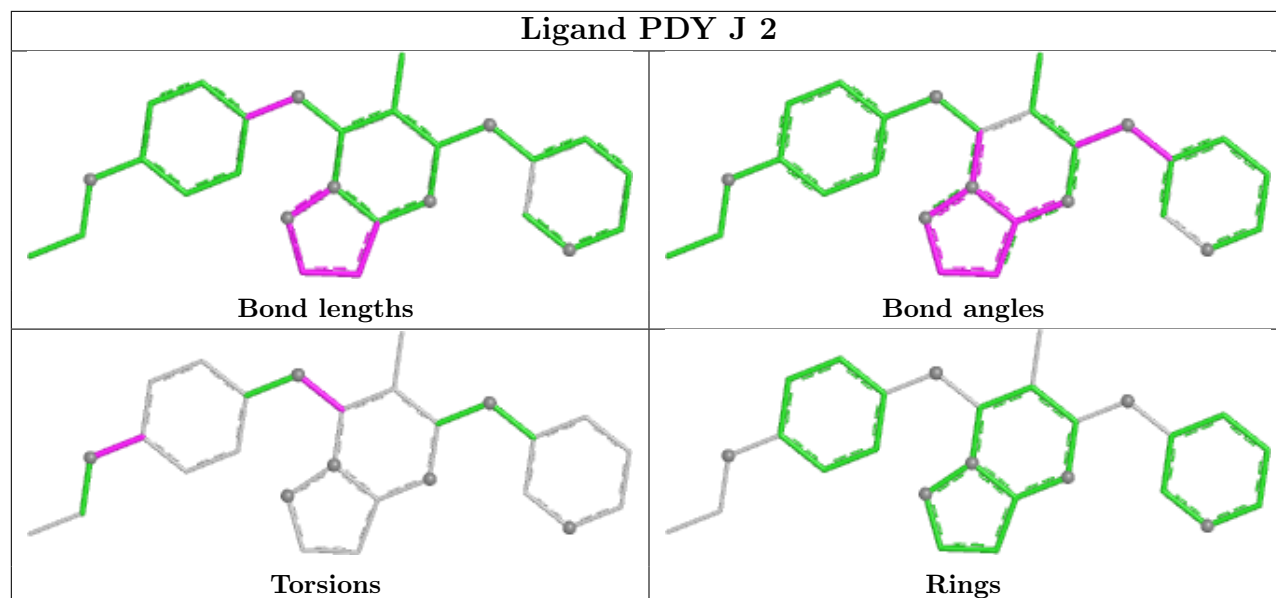
any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



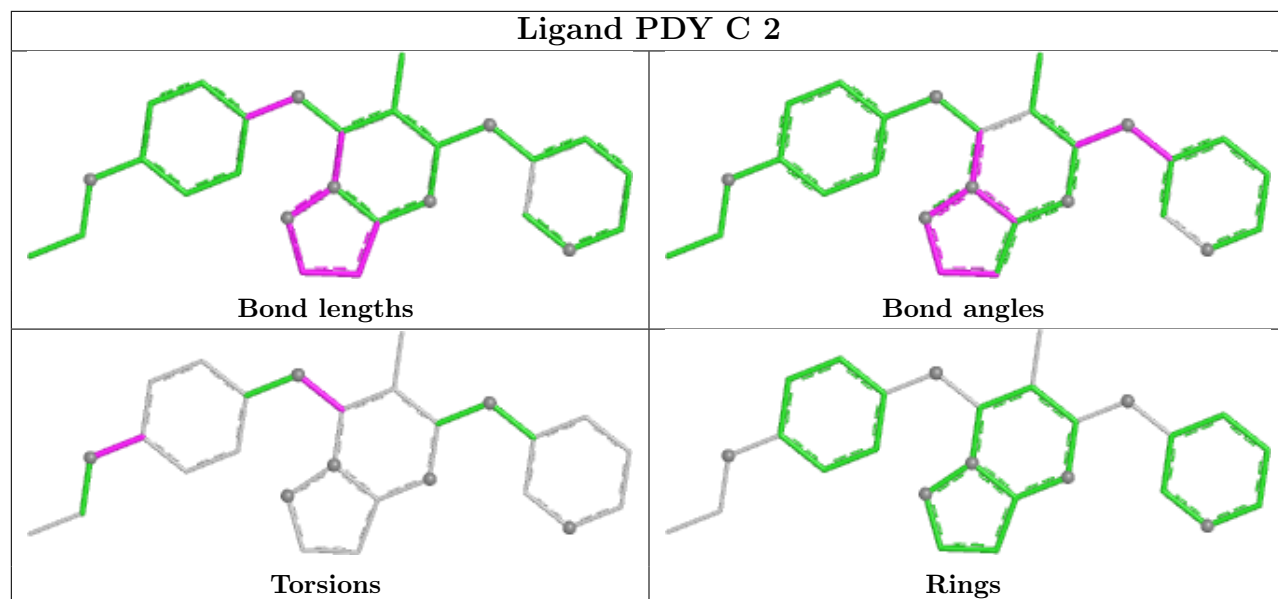
Ligand PDY L 1



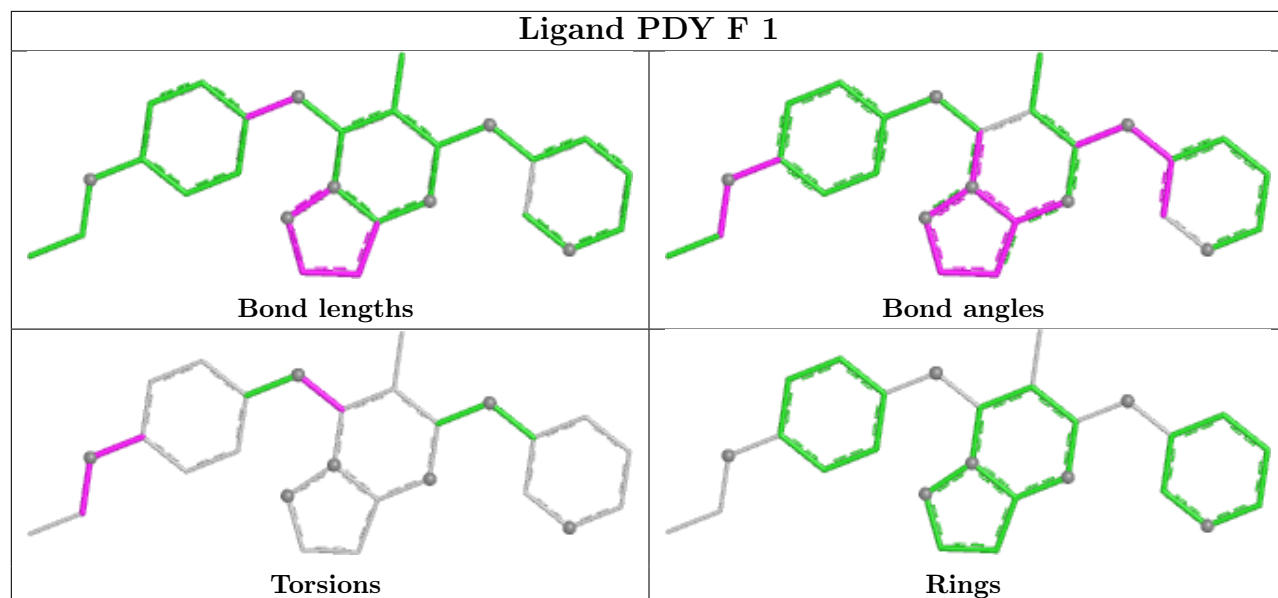
Ligand PDY J 2



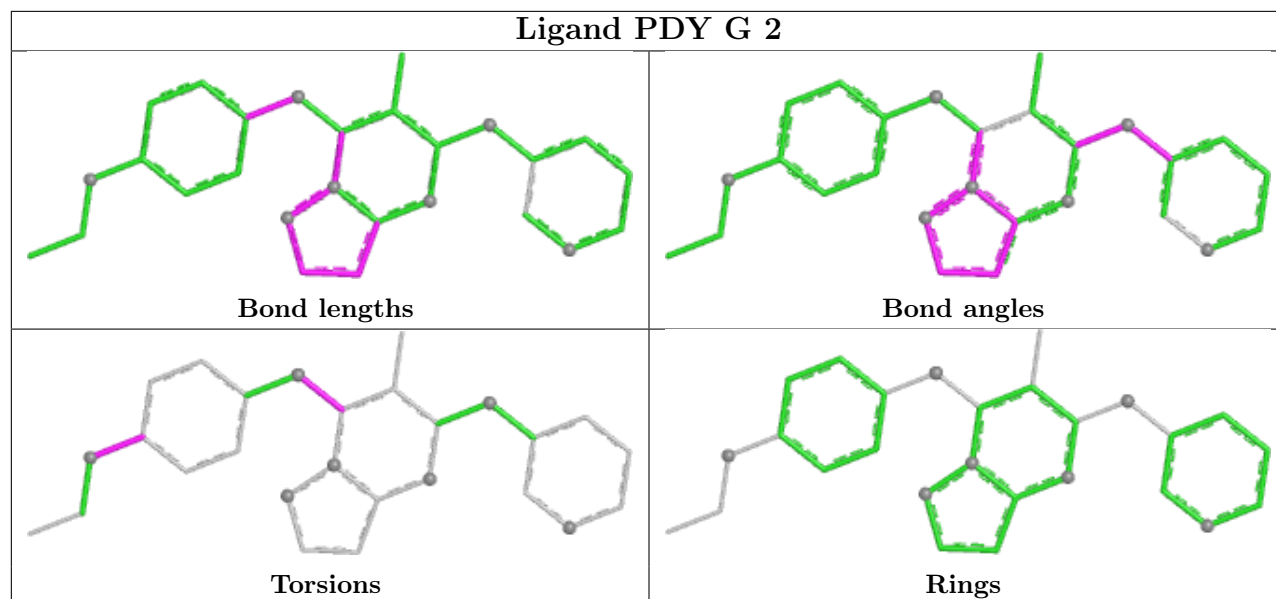
Ligand PDY C 2



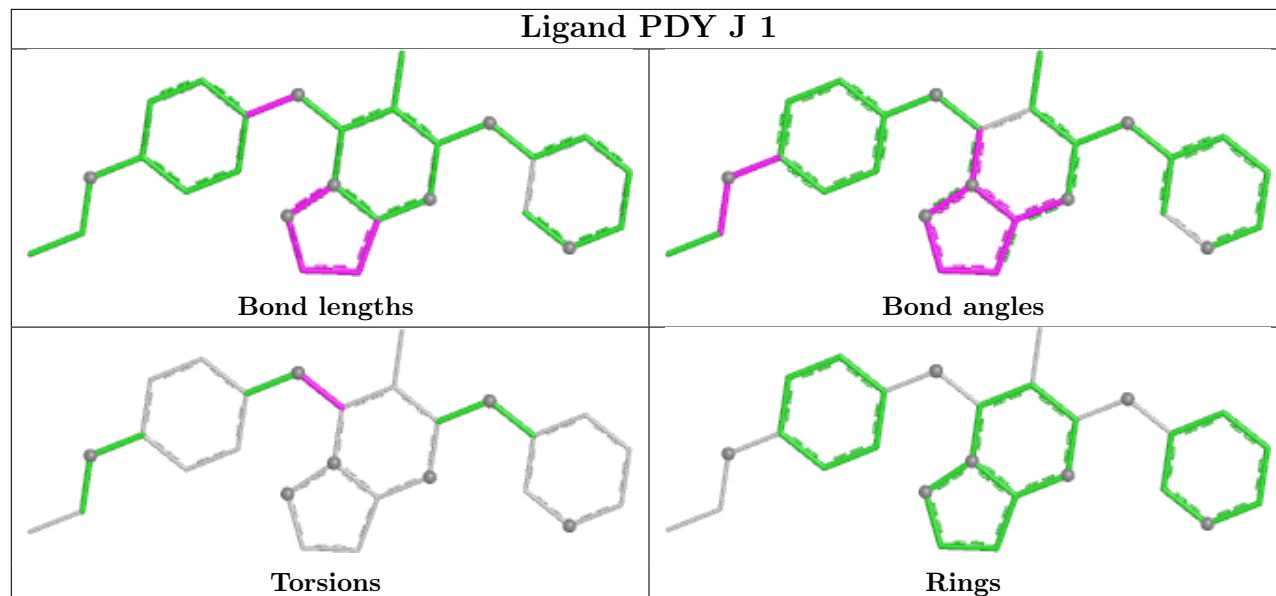
Ligand PDY F 1



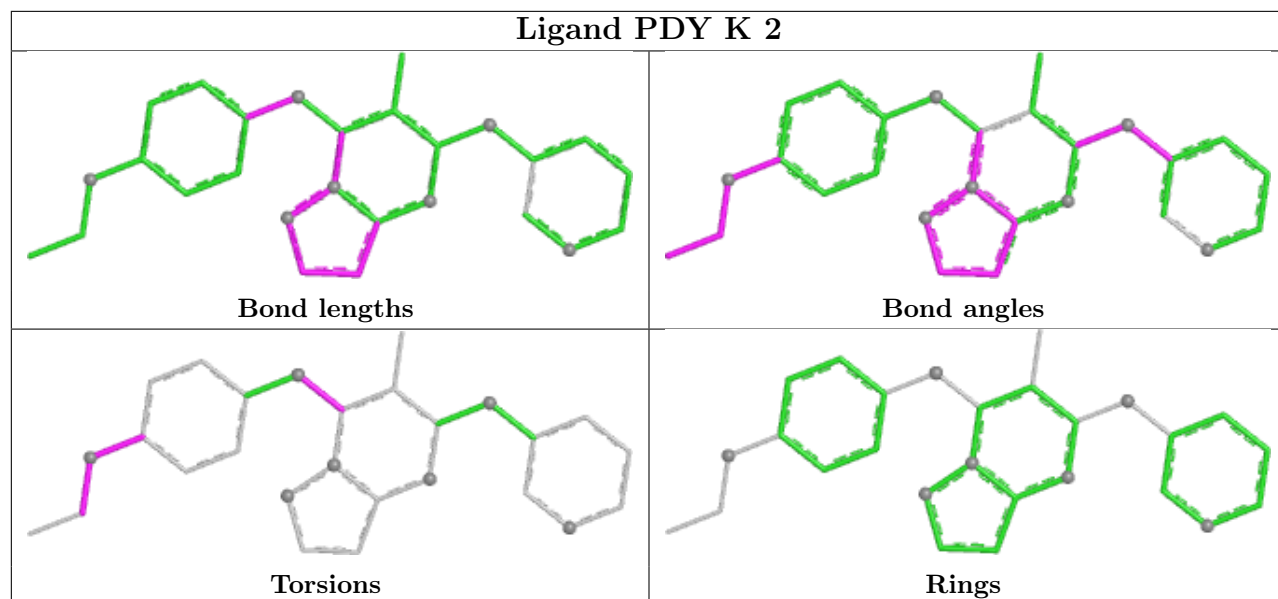
Ligand PDY G 2



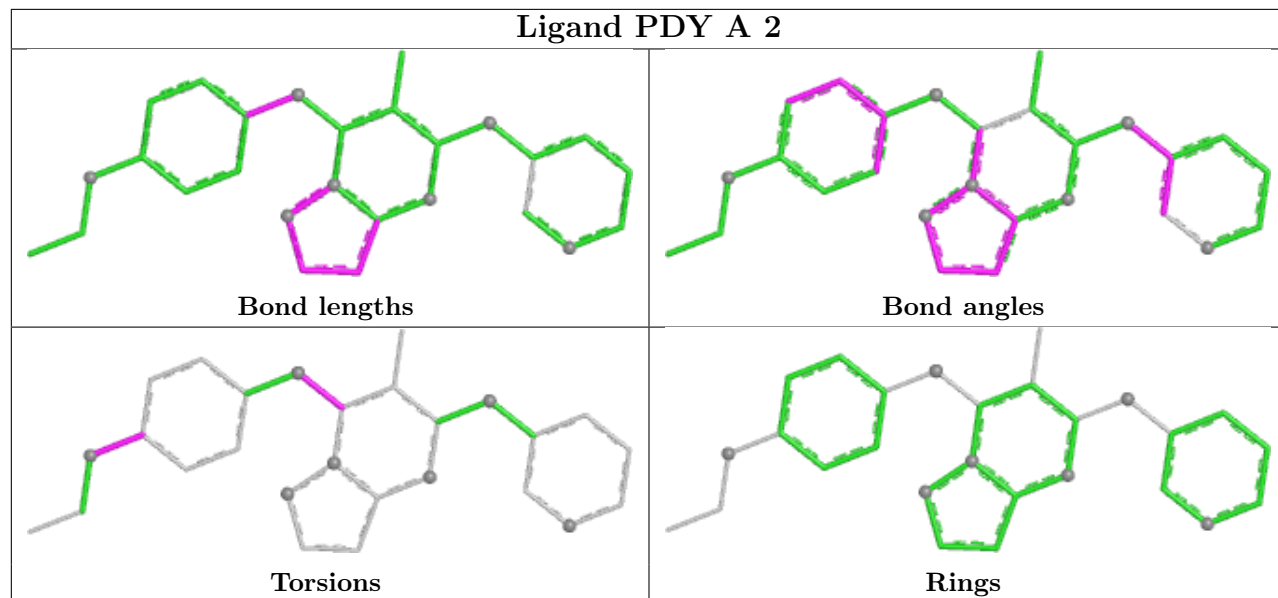
Ligand PDY J 1



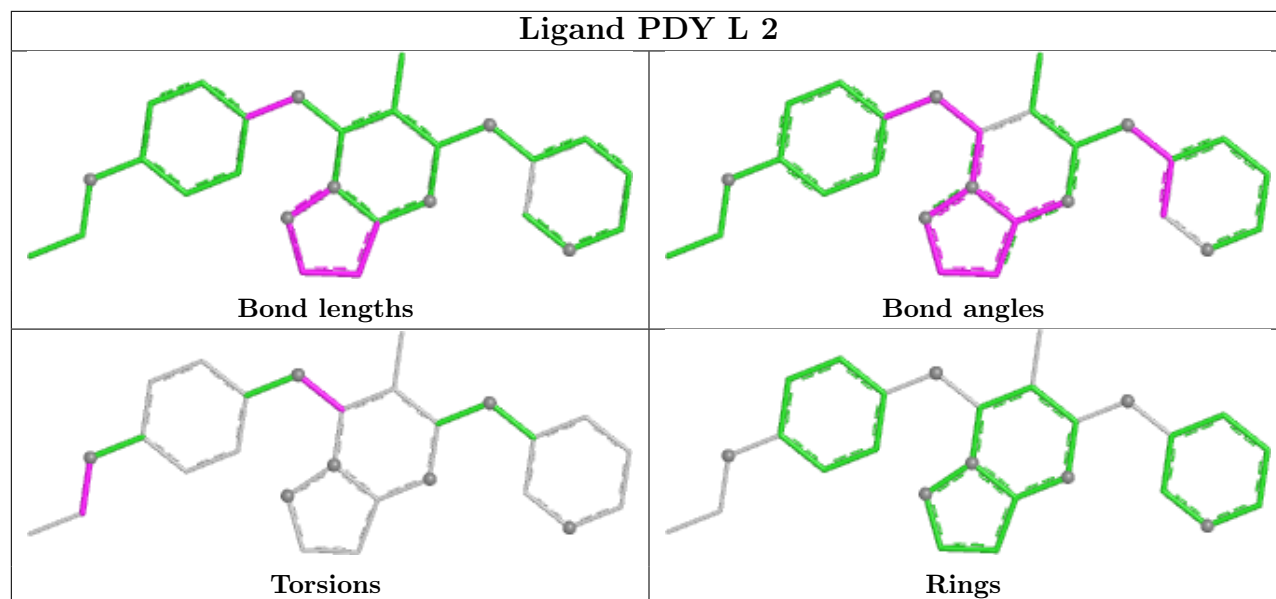
Ligand PDY K 2



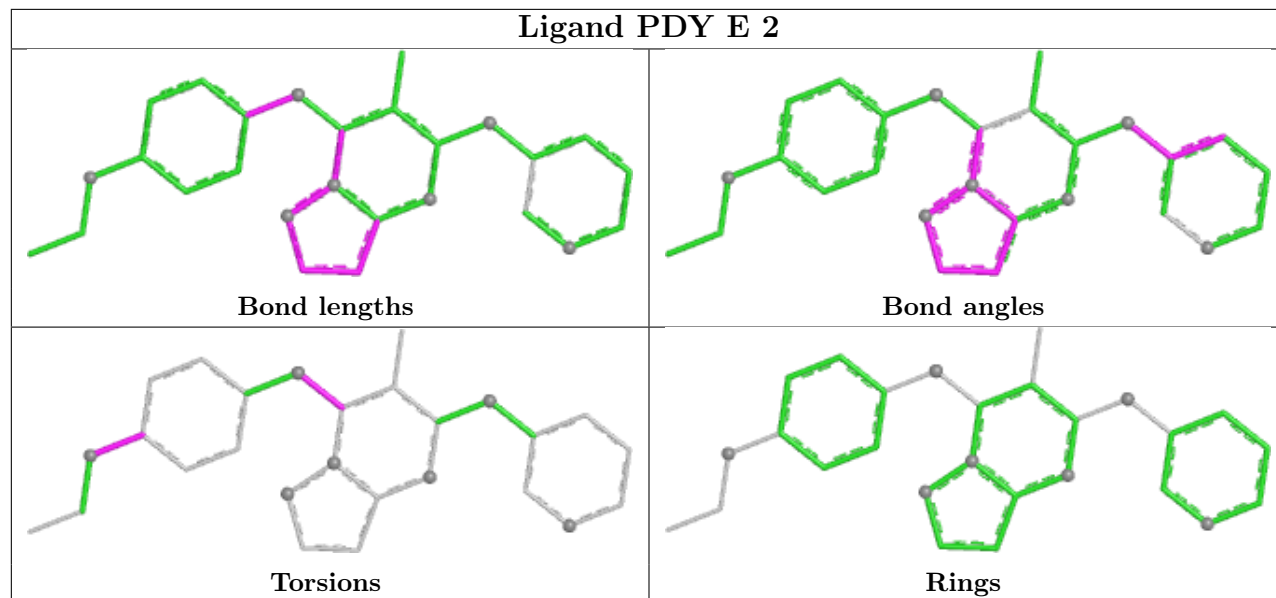
Ligand PDY A 2



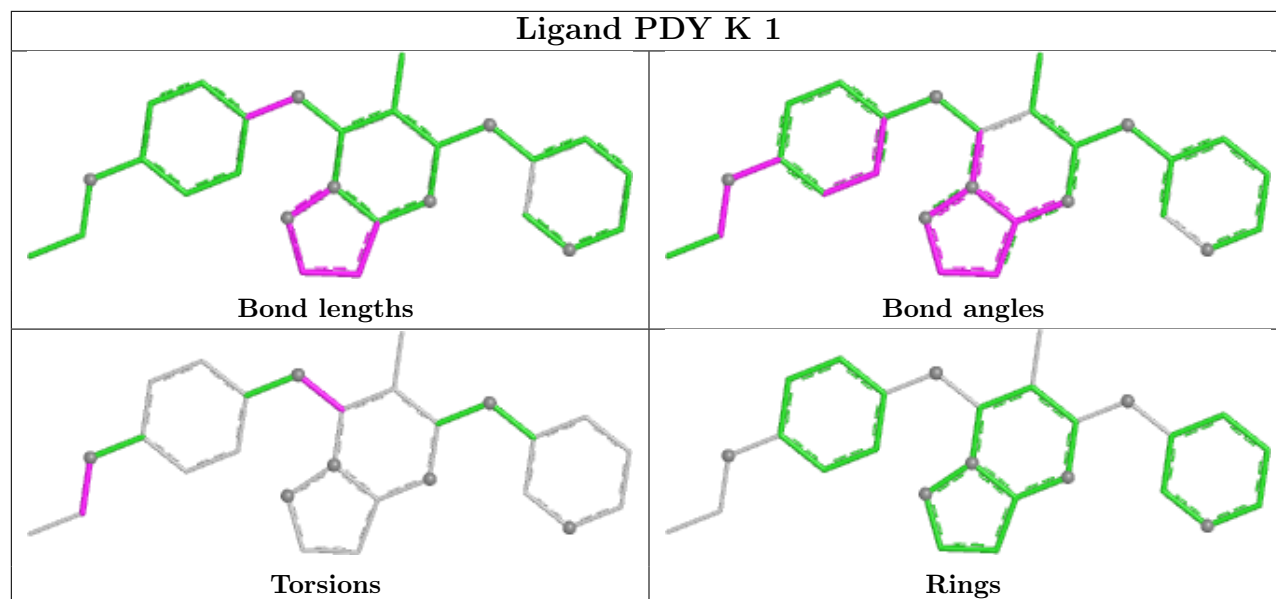
Ligand PDY L 2



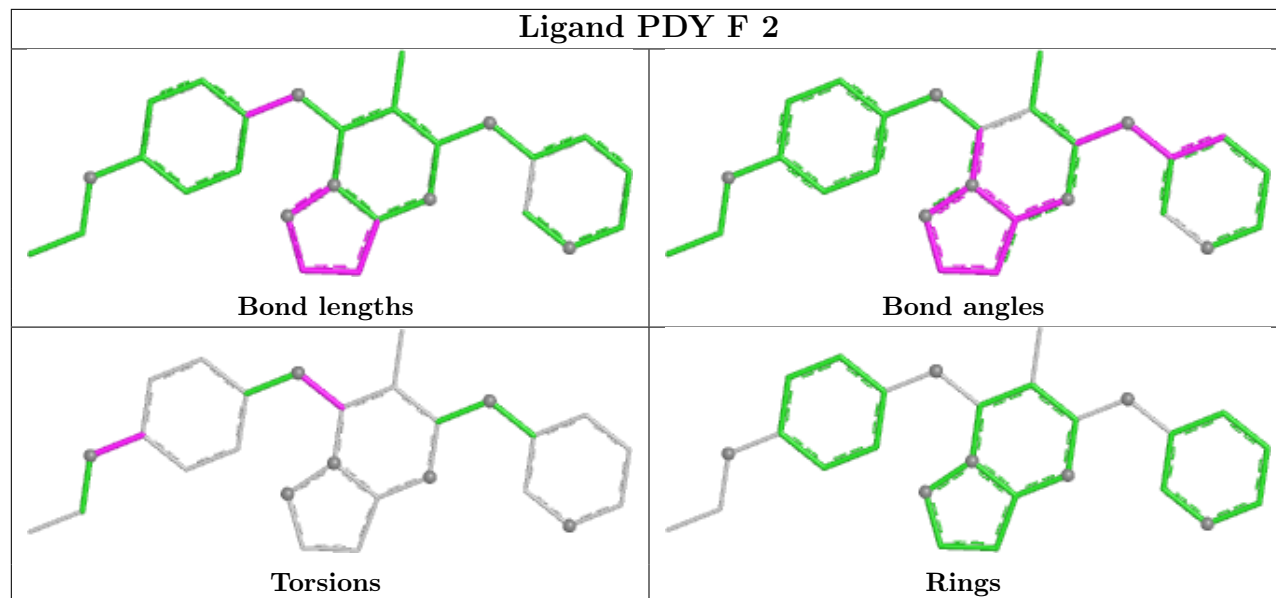
Ligand PDY E 2



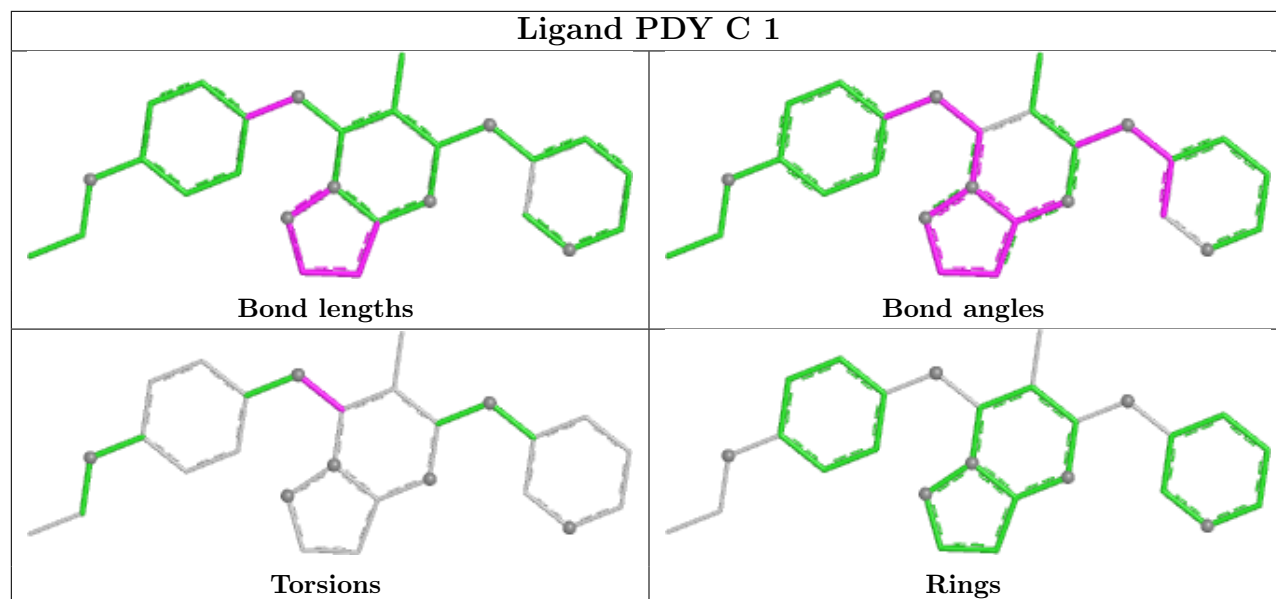
Ligand PDY K 1



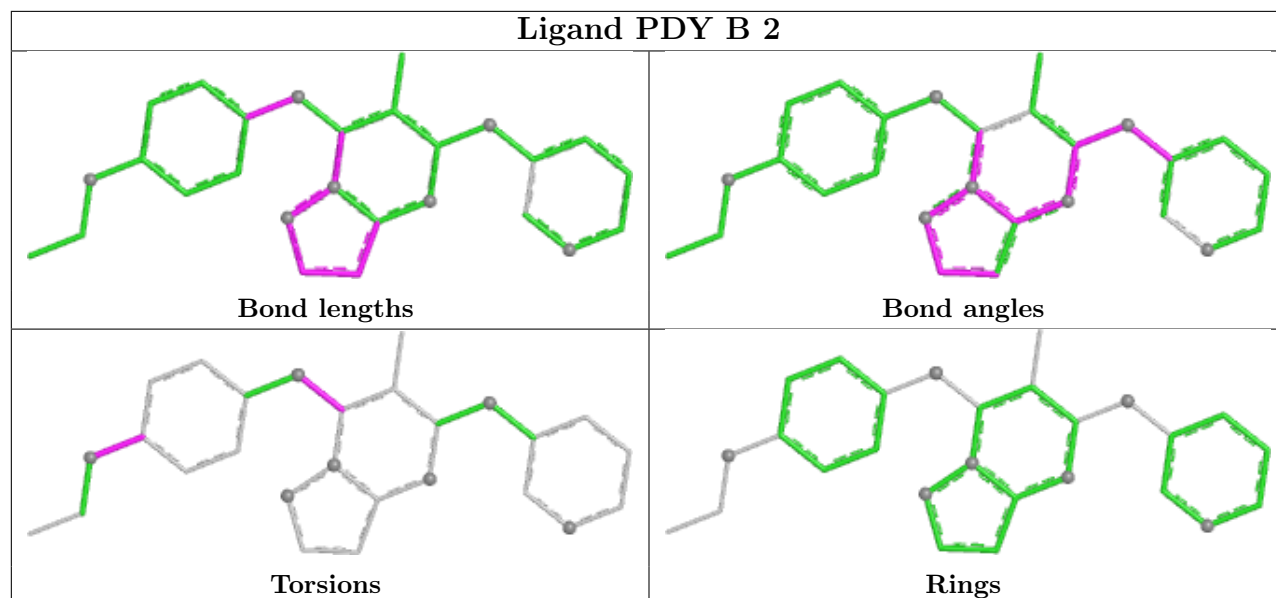
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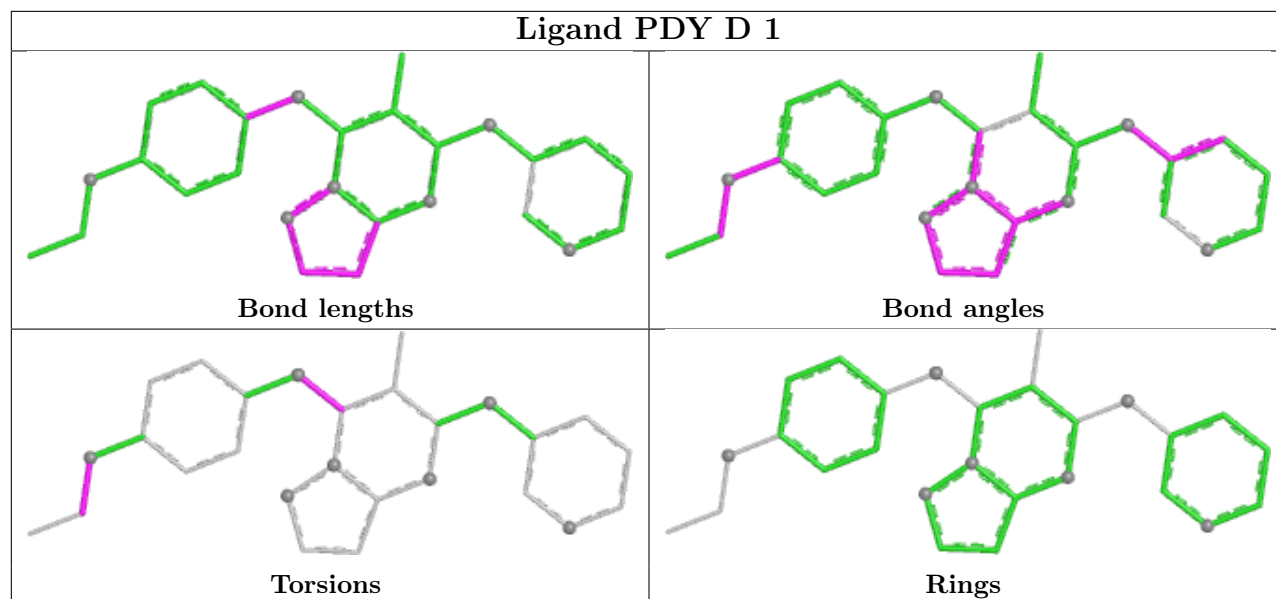
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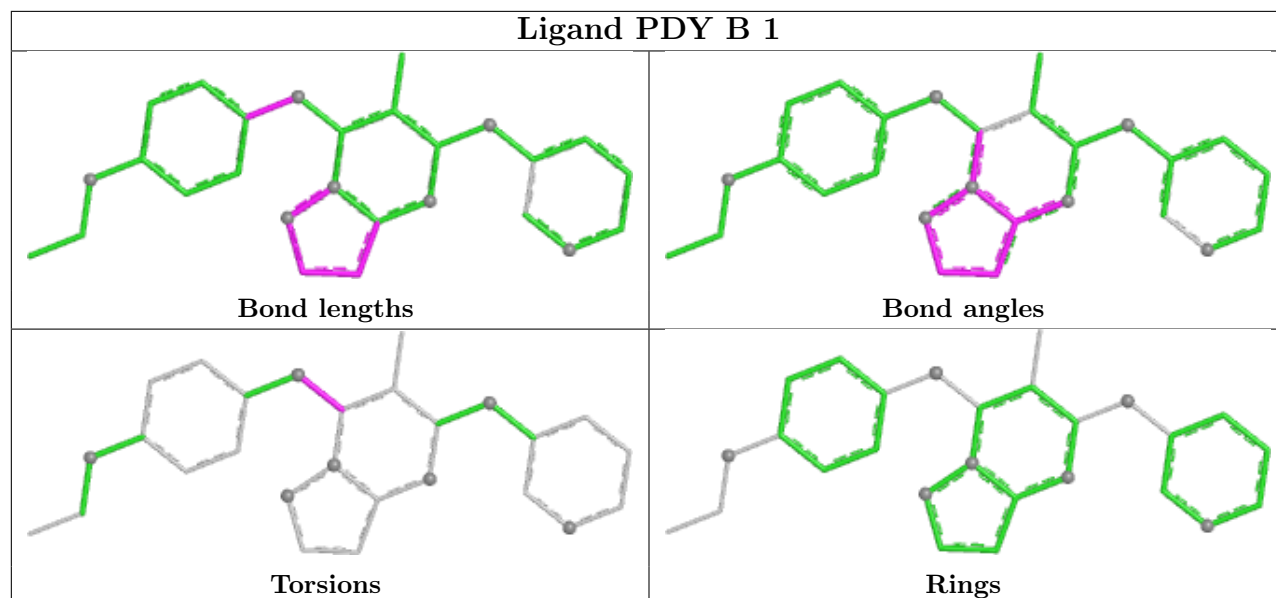
Ligand PDY B 2



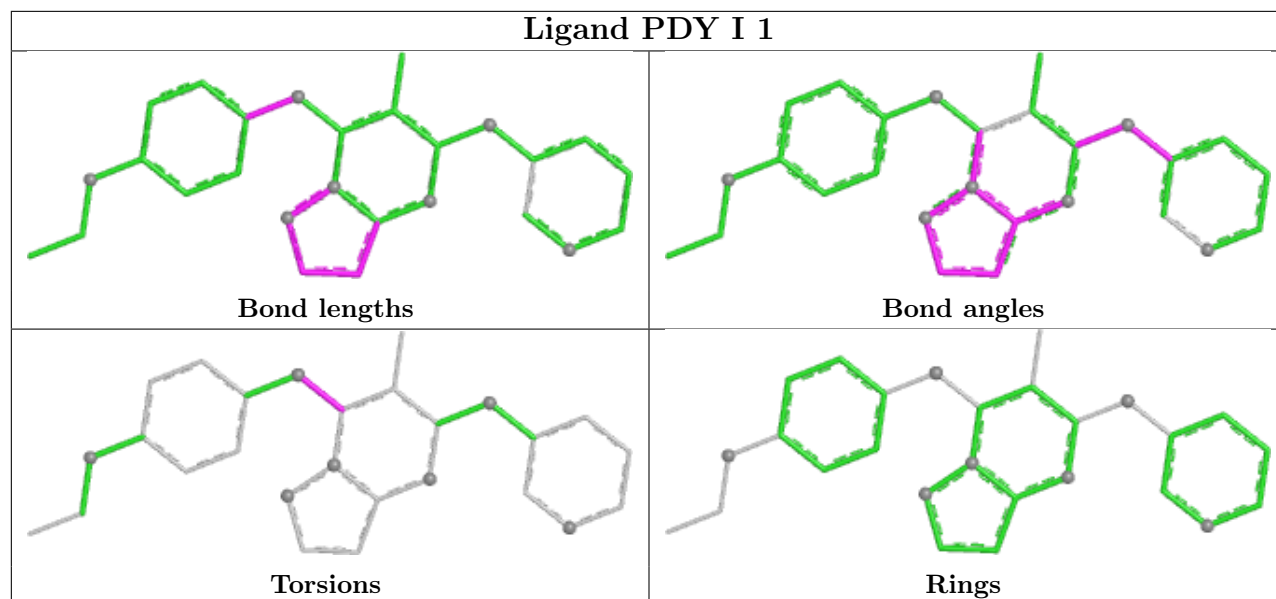
Ligand PDY D 1



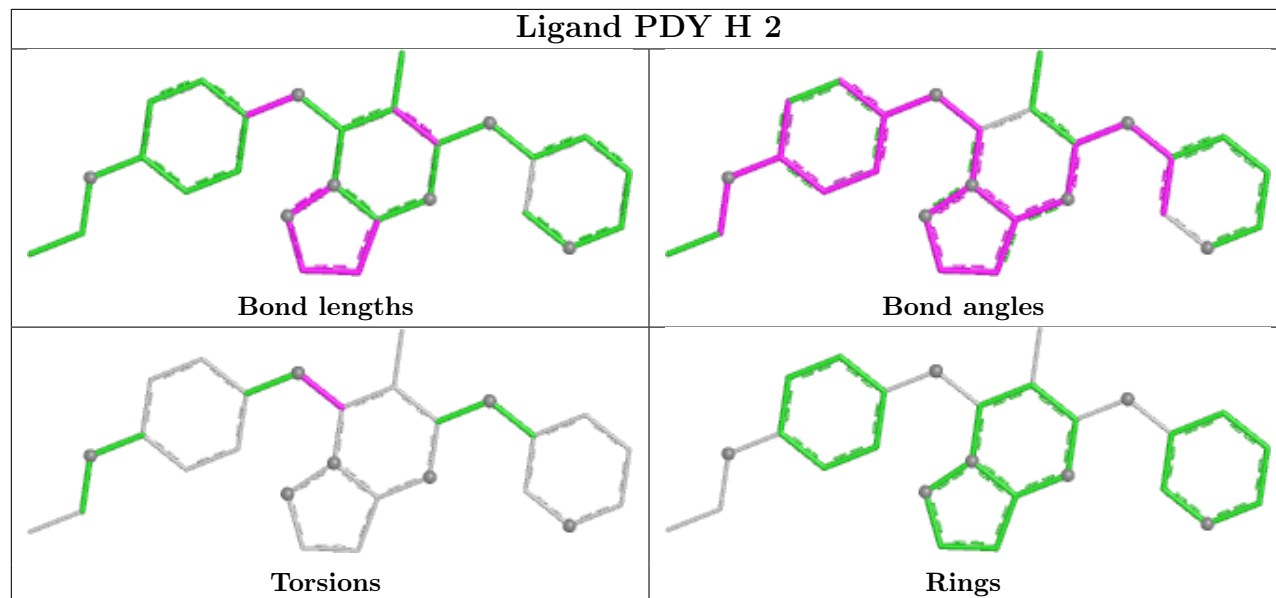
Ligand PDY B 1



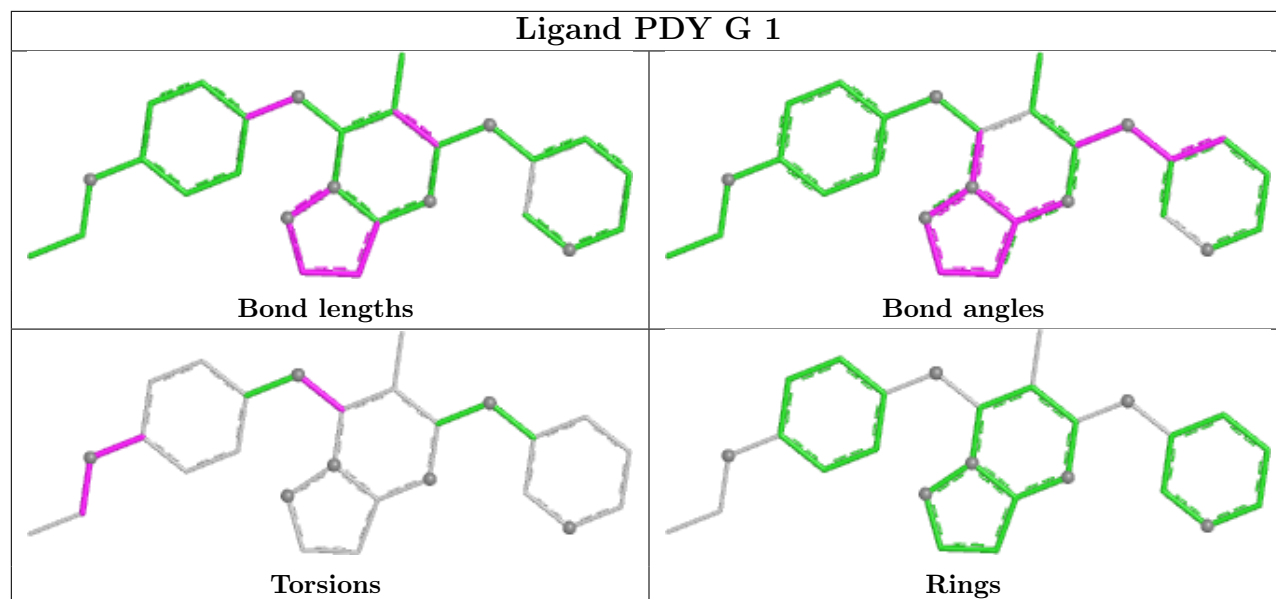
Ligand PDY I 1



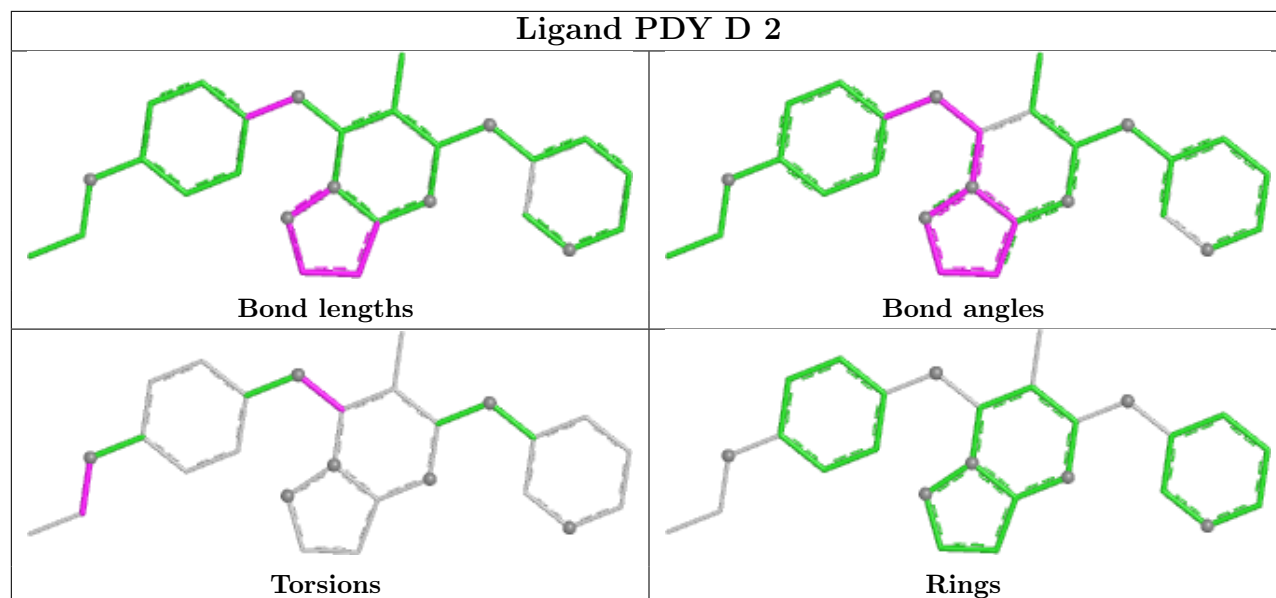
Ligand PDY H 2

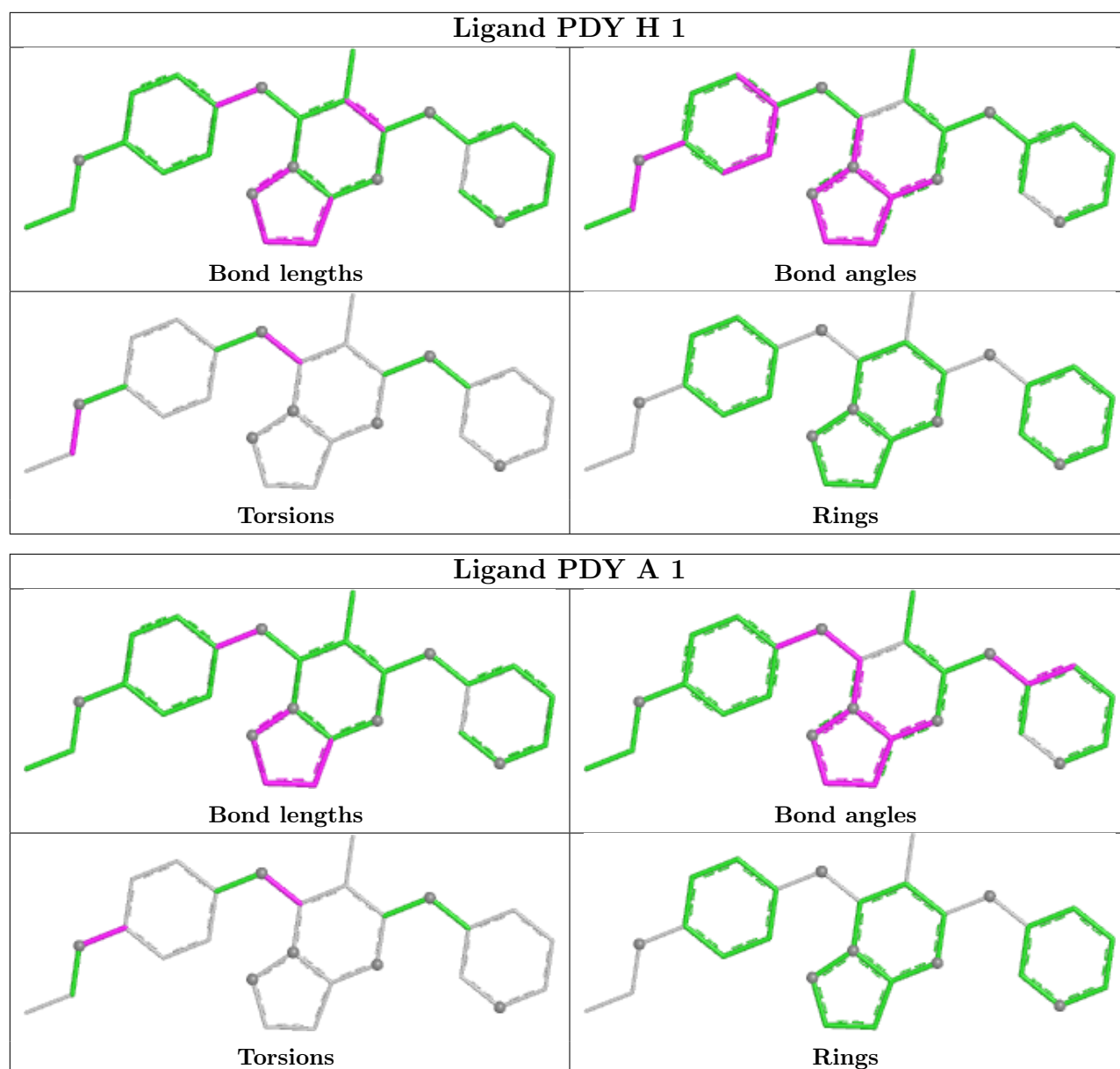


Ligand PDY G 1



Ligand PDY D 2





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	274/324 (84%)	-0.37	1 (0%) 88 85	8, 24, 56, 81	0
1	B	277/324 (85%)	-0.18	5 (1%) 67 59	7, 29, 71, 80	0
1	C	273/324 (84%)	0.01	7 (2%) 57 48	15, 40, 73, 83	0
1	D	277/324 (85%)	-0.14	6 (2%) 62 53	8, 32, 70, 81	0
1	E	276/324 (85%)	-0.29	6 (2%) 62 53	10, 28, 58, 76	0
1	F	287/324 (88%)	-0.22	9 (3%) 51 42	4, 25, 70, 86	0
1	G	273/324 (84%)	-0.03	4 (1%) 72 64	16, 38, 67, 79	0
1	H	275/324 (84%)	-0.06	6 (2%) 62 53	13, 39, 68, 84	0
1	I	275/324 (84%)	-0.19	7 (2%) 58 48	14, 30, 66, 97	0
1	J	275/324 (84%)	0.28	13 (4%) 36 28	27, 52, 81, 100	0
1	K	273/324 (84%)	0.22	11 (4%) 42 34	25, 49, 76, 98	0
1	L	276/324 (85%)	0.16	10 (3%) 46 38	15, 46, 83, 110	0
All	All	3311/3888 (85%)	-0.07	85 (2%) 57 48	4, 37, 73, 110	0

The worst 5 of 85 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	230	VAL	4.6
1	B	230	VAL	4.5
1	G	273	PRO	4.5
1	C	154	GLY	4.2
1	F	234	VAL	4.2

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 ⓘ

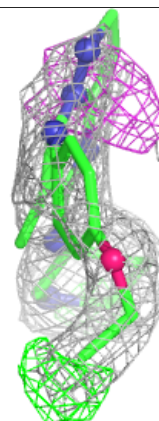
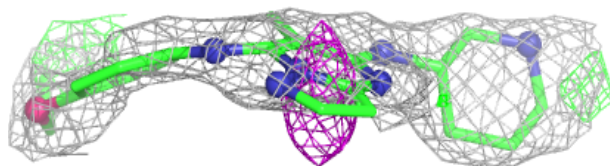
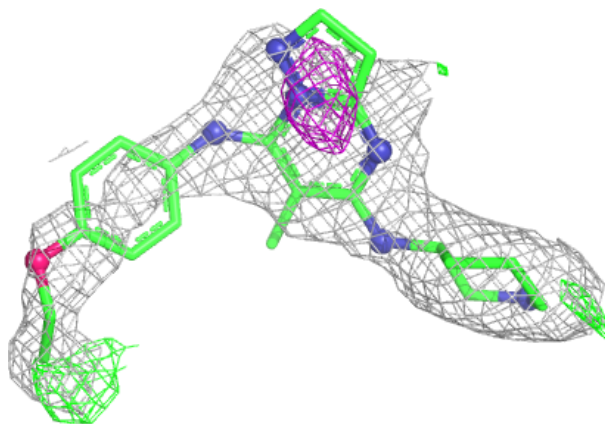
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	PDY	D	2	27/27	0.62	0.21	65,74,80,81	0
2	PDY	K	2	27/27	0.69	0.16	61,67,79,80	0
2	PDY	E	2	27/27	0.70	0.18	60,67,69,69	0
2	PDY	I	2	27/27	0.71	0.18	53,61,74,75	0
2	PDY	L	2	27/27	0.72	0.18	71,75,77,77	0
2	PDY	A	2	27/27	0.73	0.17	60,65,69,71	0
2	PDY	G	2	27/27	0.80	0.13	52,56,64,64	0
2	PDY	H	2	27/27	0.81	0.14	52,55,60,60	0
3	SO4	F	3	5/5	0.82	0.12	61,62,64,65	0
2	PDY	J	2	27/27	0.84	0.13	59,62,67,68	0
2	PDY	C	2	27/27	0.87	0.11	48,50,62,63	0
2	PDY	B	2	27/27	0.92	0.09	20,29,34,35	0
2	PDY	C	1	27/27	0.92	0.10	18,32,56,58	0
2	PDY	F	2	27/27	0.94	0.08	20,24,28,29	0
2	PDY	K	1	27/27	0.94	0.09	27,44,54,55	0
2	PDY	I	1	27/27	0.94	0.08	5,19,43,45	0
2	PDY	L	1	27/27	0.94	0.08	30,34,47,50	0
2	PDY	H	1	27/27	0.94	0.09	22,31,54,55	0
2	PDY	J	1	27/27	0.94	0.08	31,39,54,55	0
2	PDY	F	1	27/27	0.95	0.07	5,15,32,34	0
2	PDY	D	1	27/27	0.95	0.08	16,23,43,44	0
2	PDY	G	1	27/27	0.95	0.07	4,20,38,43	0
2	PDY	B	1	27/27	0.96	0.07	6,16,37,38	0
2	PDY	E	1	27/27	0.96	0.07	7,23,37,38	0
2	PDY	A	1	27/27	0.97	0.07	2,11,31,32	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.

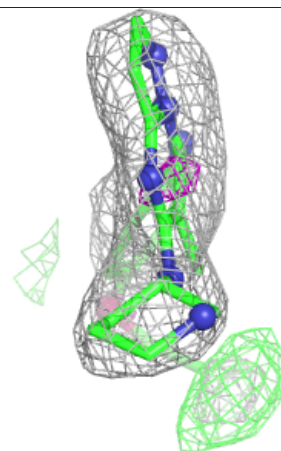
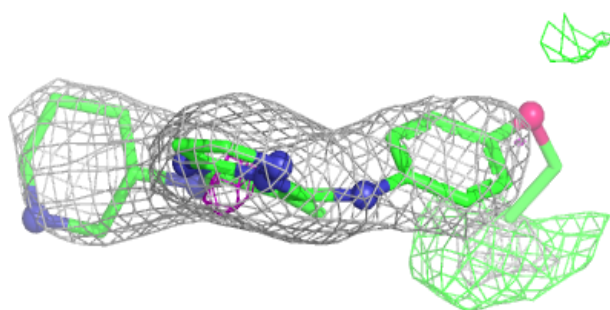
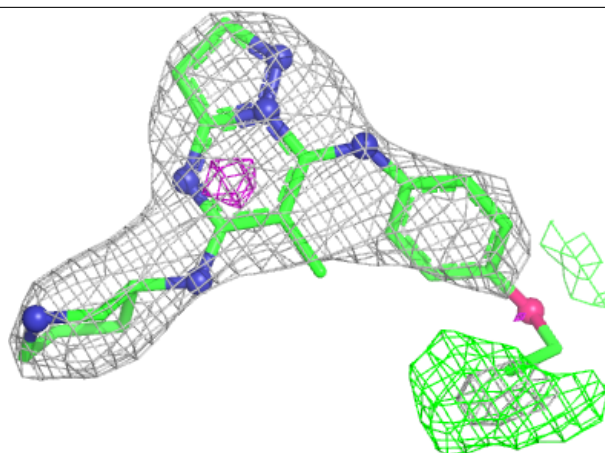
Electron density around PDY D 2:

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

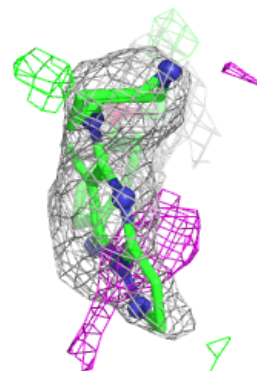
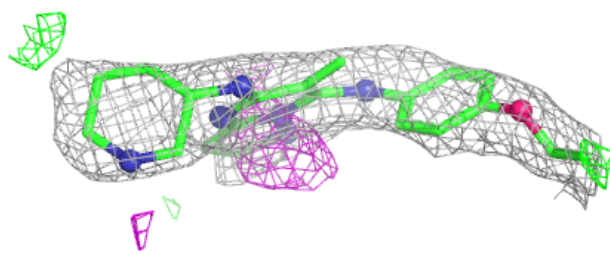
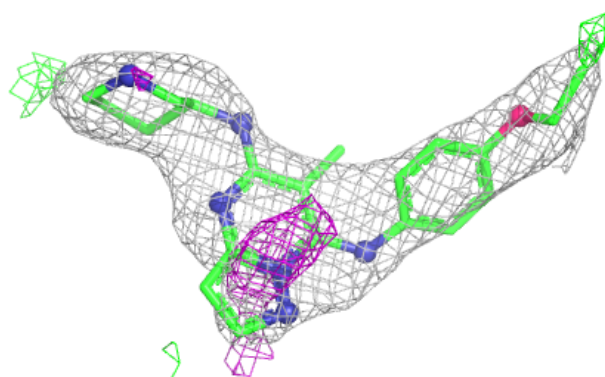


Electron density around PDY K 2:

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

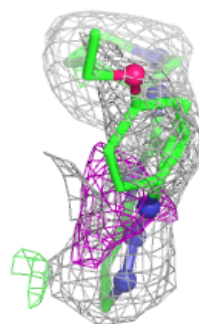
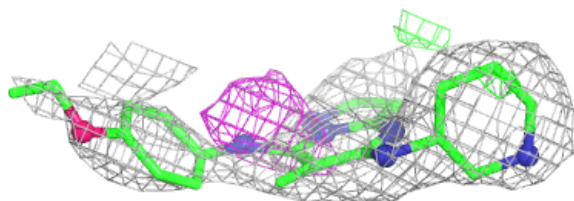
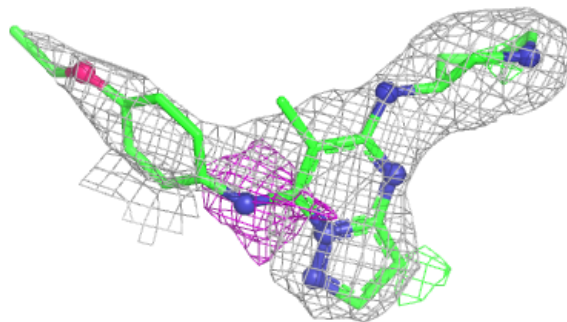
**Electron density around PDY E 2:**

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

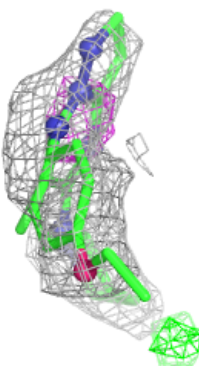
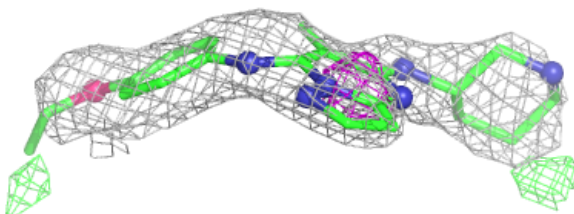
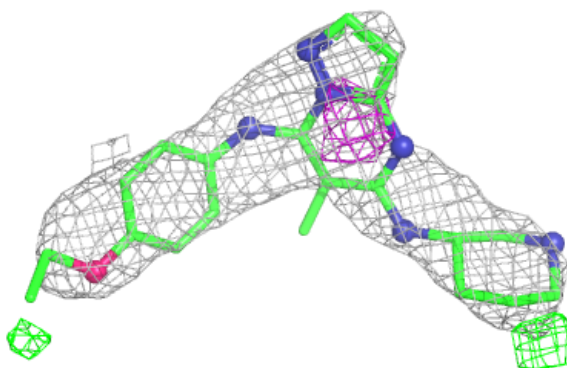


Electron density around PDY I 2:

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

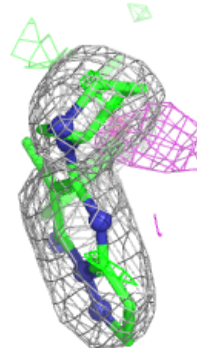
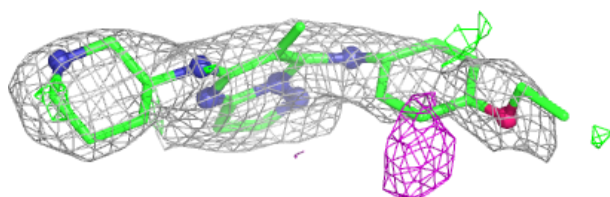
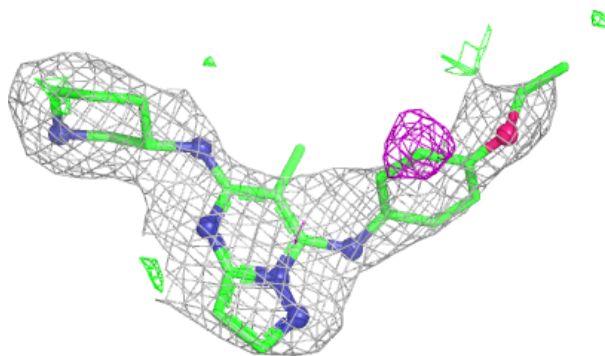
**Electron density around PDY L 2:**

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

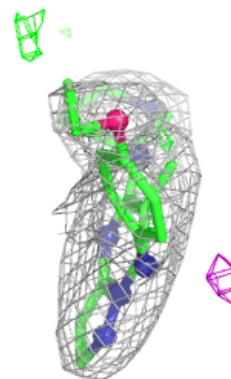
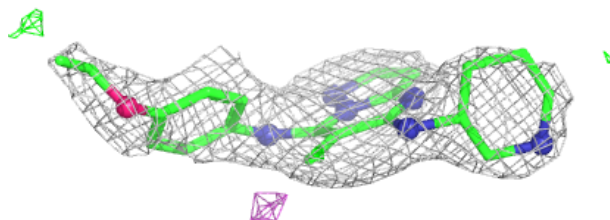
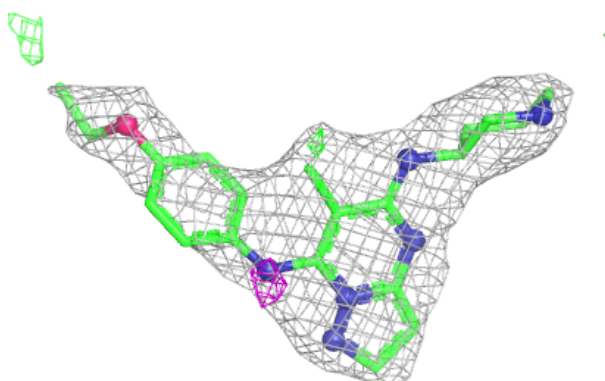


Electron density around PDY A 2:

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

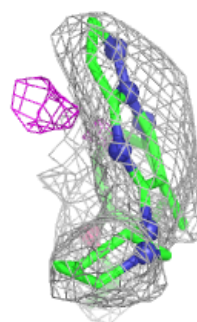
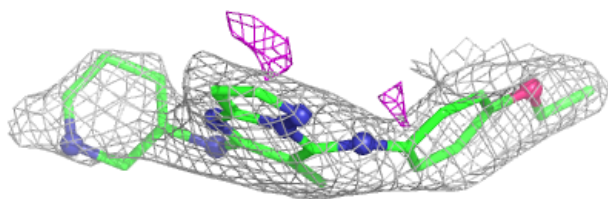
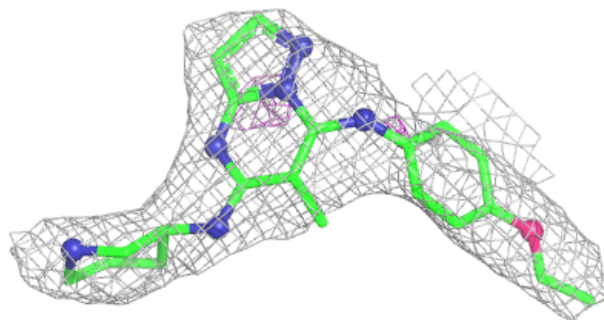
**Electron density around PDY G 2:**

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

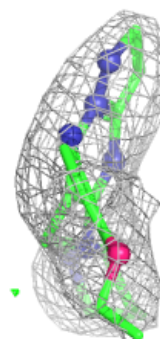
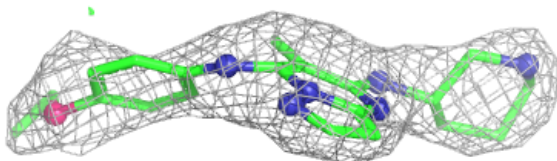
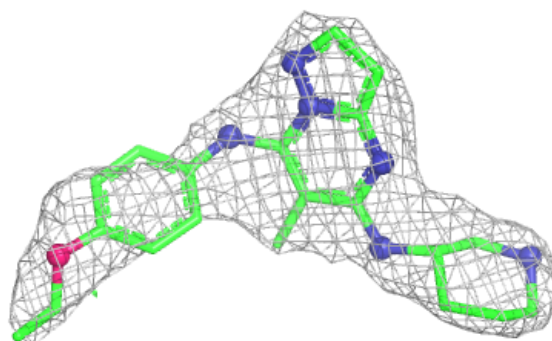


Electron density around PDY H 2:

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

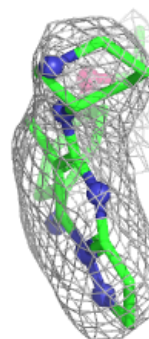
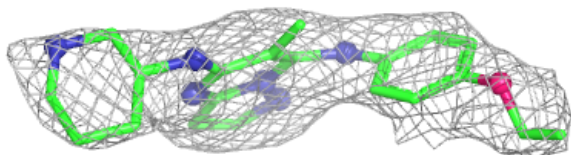
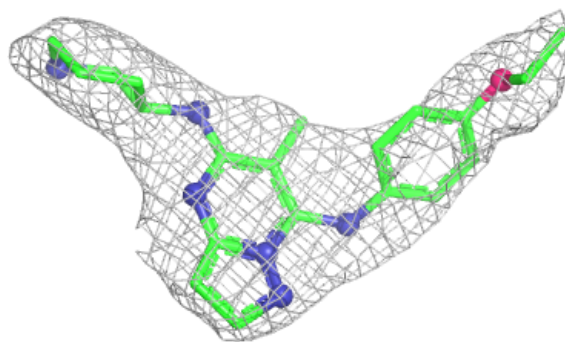
**Electron density around PDY J 2:**

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

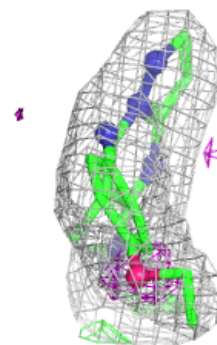
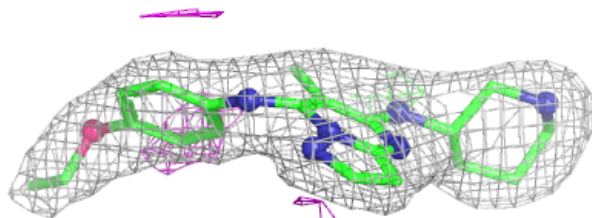
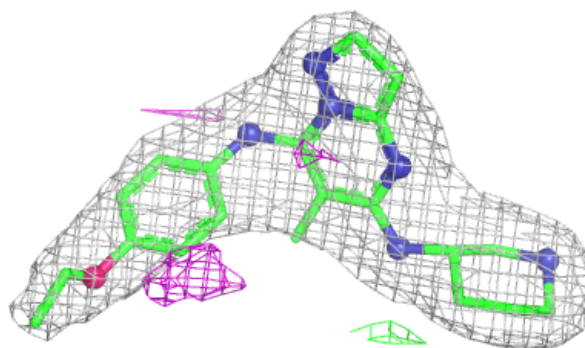


Electron density around PDY C 2:

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

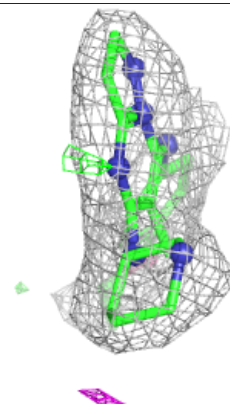
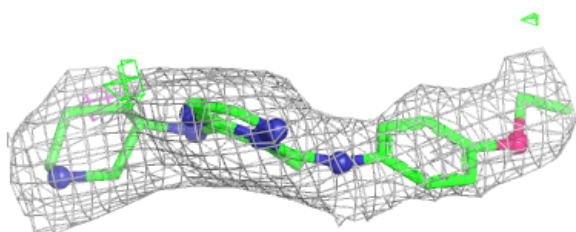
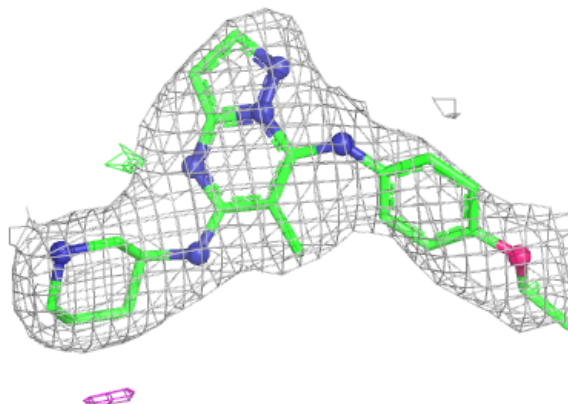
**Electron density around PDY B 2:**

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

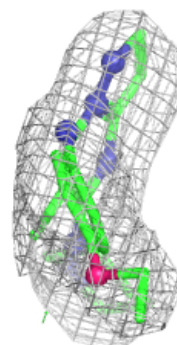
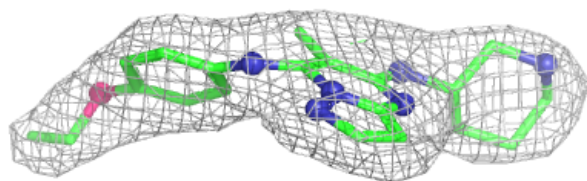
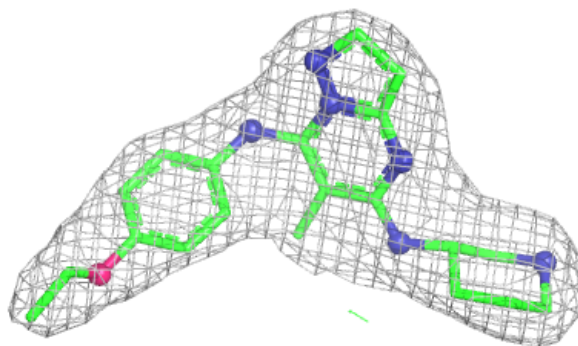


Electron density around PDY C 1:

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

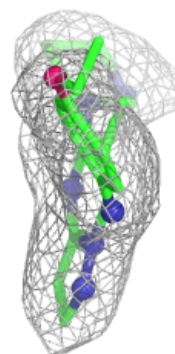
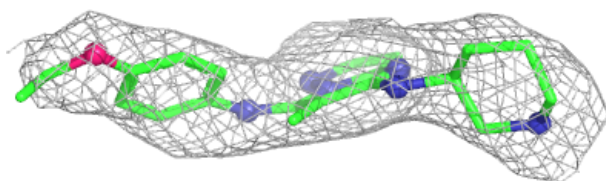
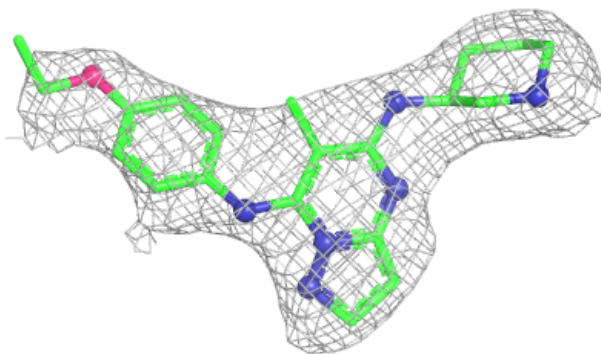
**Electron density around PDY F 2:**

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

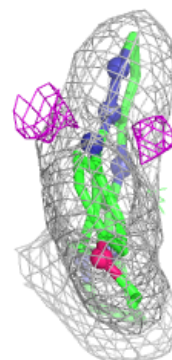
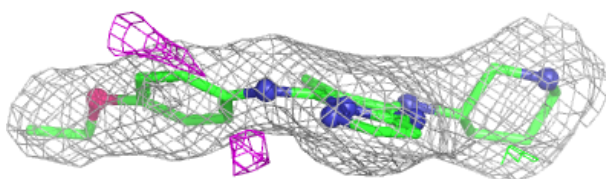
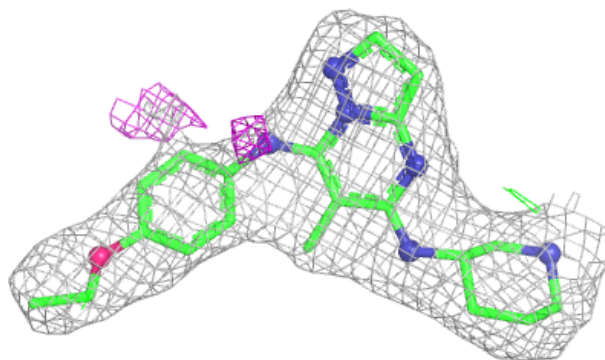


Electron density around PDY K 1:

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

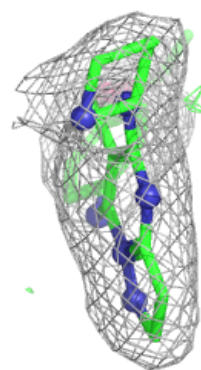
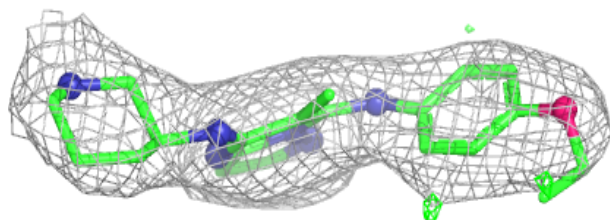
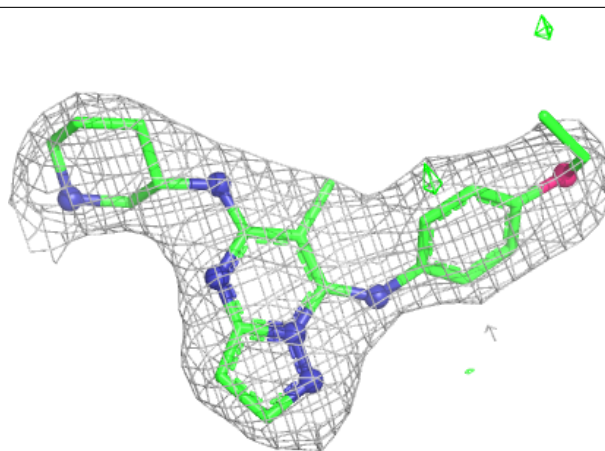
**Electron density around PDY I 1:**

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



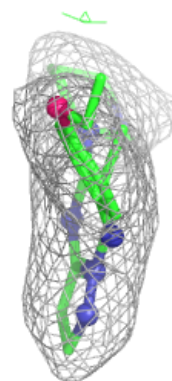
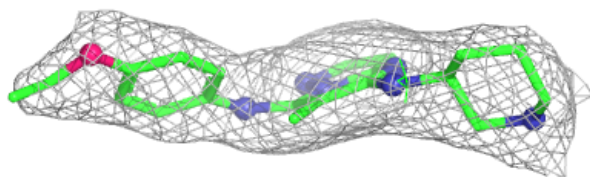
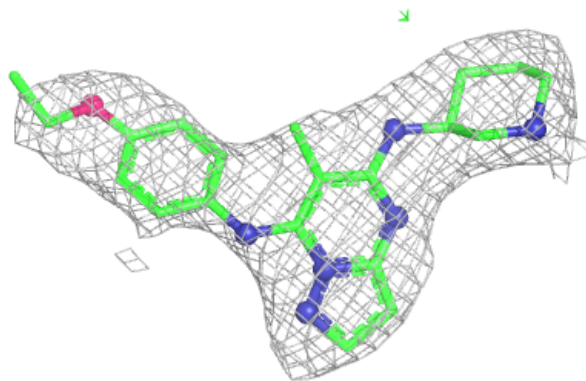
Electron density around PDY L 1:

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

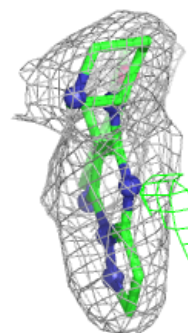
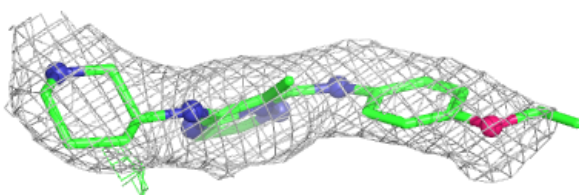
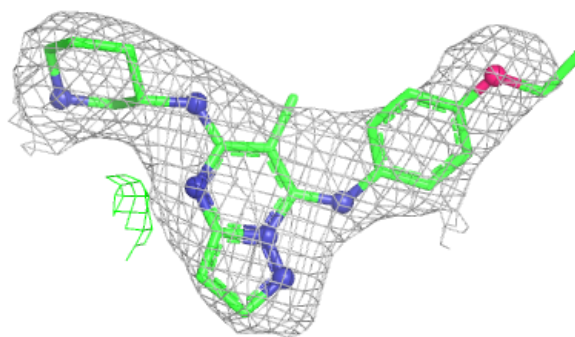


Electron density around PDY H 1:

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

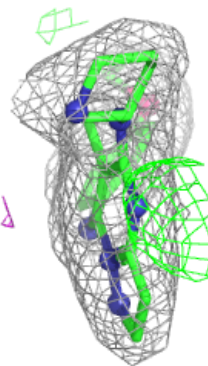
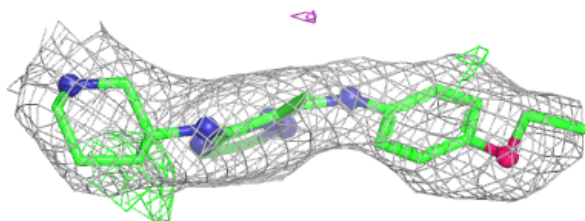
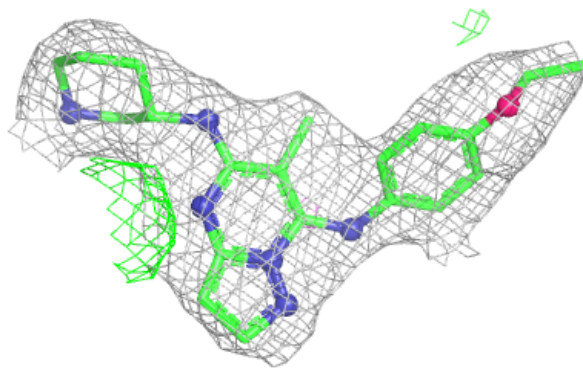
**Electron density around PDY J 1:**

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

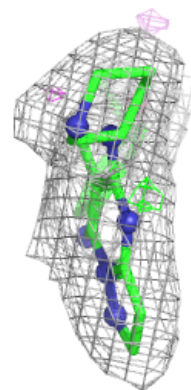
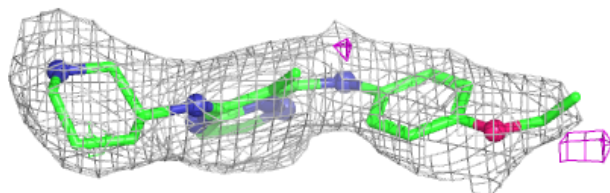
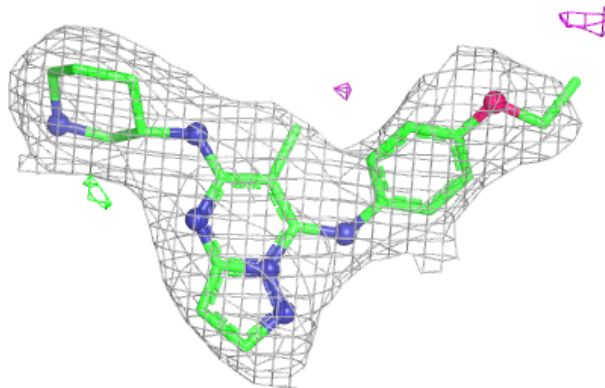


Electron density around PDY F 1:

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

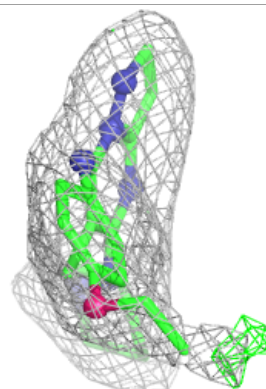
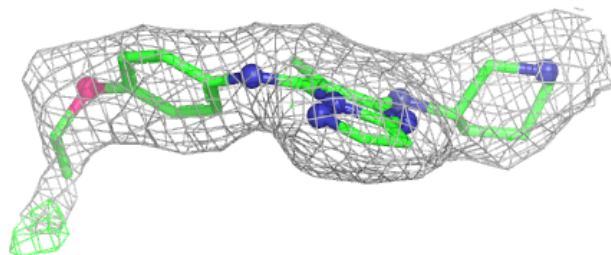
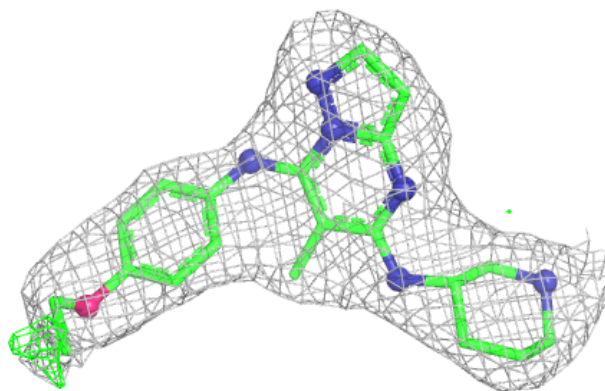
**Electron density around PDY D 1:**

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

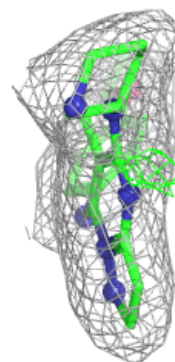
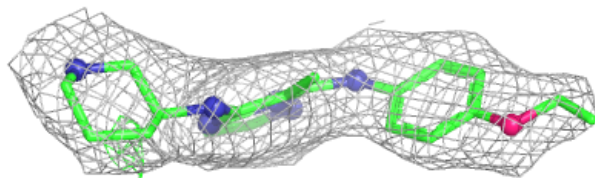
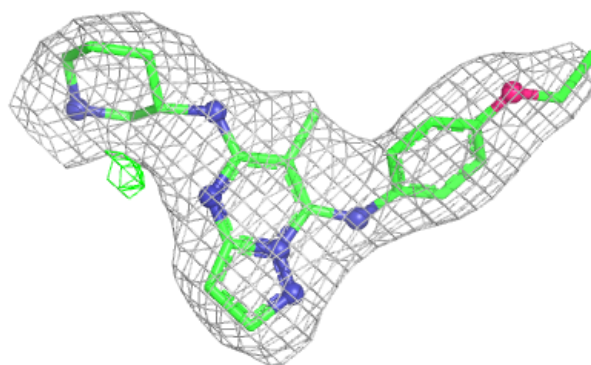


Electron density around PDY G 1:

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

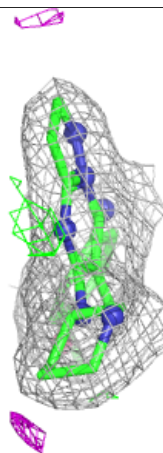
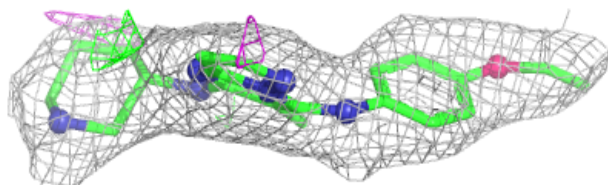
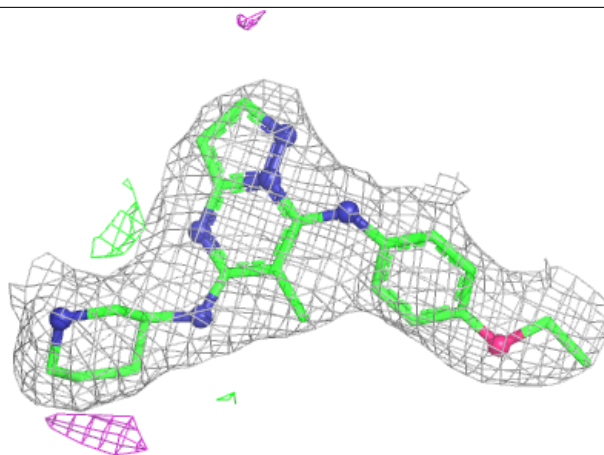
**Electron density around PDY B 1:**

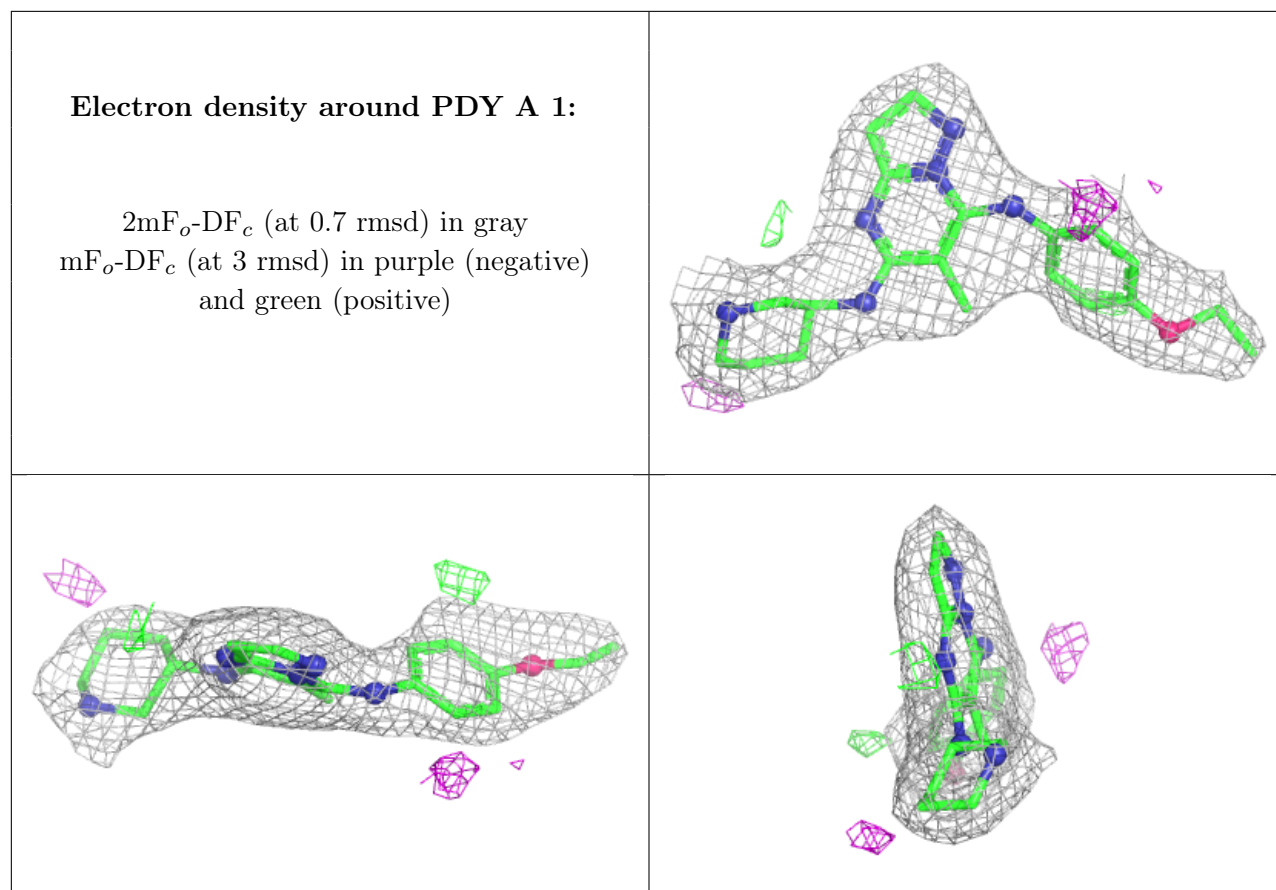
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around PDY E 1:

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





6.5 Other polymers ⓘ

There are no such residues in this entry.