wwPDB X-ray Structure Validation Summary Report (i)

Nov 10, 2025 – 05:25 pm GMT

PDB ID	:	9HYB / pdb_00009hyb
Title	:	CRYSTAL STRUCTURE OF THE SMARCA2-VCB-COMPLEX WITH PROTAC P3
Authors	:	Bader, G.; Wolkerstorfer, B.
Deposited on	:	2025-01-09
Resolution	:	2.84 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 (i) 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 (i)) were used in the production of this report:

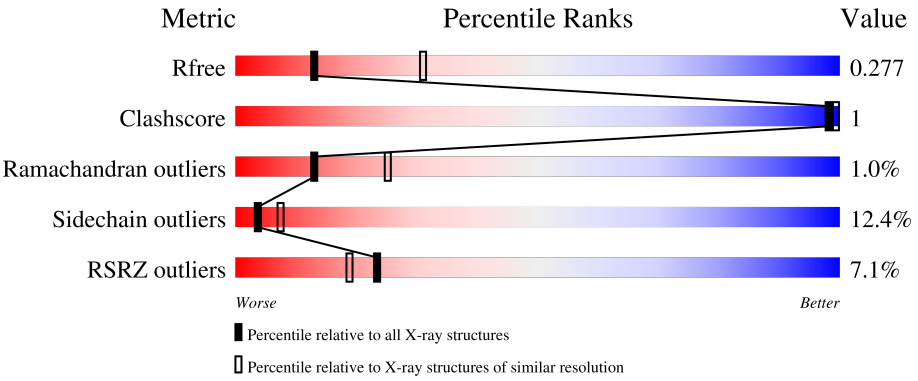
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.84 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	1367 (2.86-2.82)
Clashscore	180529	1455 (2.86-2.82)
Ramachandran outliers	177936	1422 (2.86-2.82)
Sidechain outliers	177891	1423 (2.86-2.82)
RSRZ outliers	164620	1368 (2.86-2.82)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	104	92% 8%
1	D	104	4% 84% 15%
1	G	104	7% 93% 7%
1	J	104	9% 80% 18%
2	B	97	11% 76% 13% 10%

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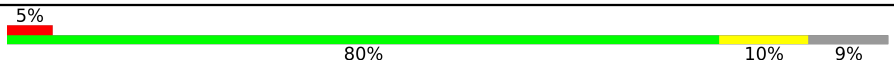
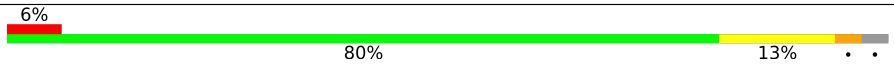
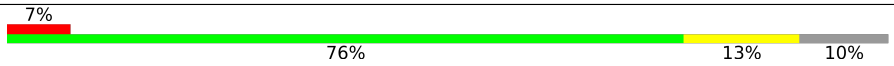
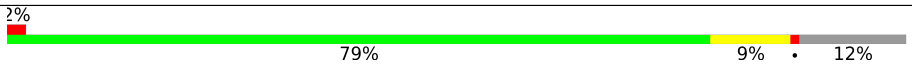
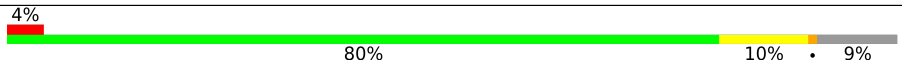
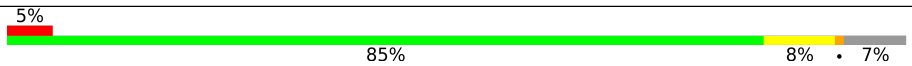
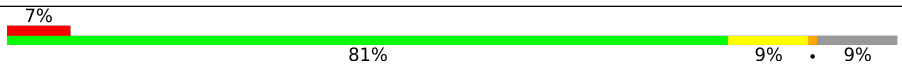
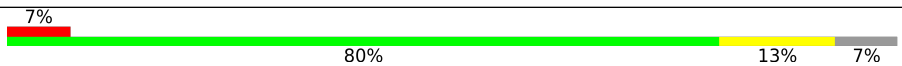
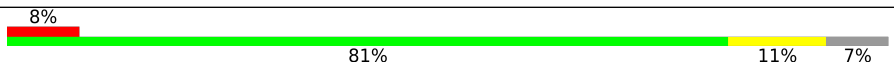
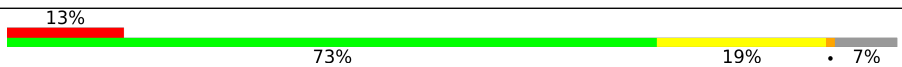
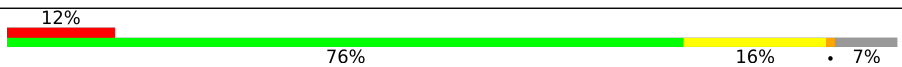
Mol	Chain	Length	Quality of chain
2	E	97	
2	H	97	
2	K	97	
3	C	162	
3	F	162	
3	I	162	
3	L	162	
4	M	123	
4	N	123	
4	O	123	
4	P	123	

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 30441 atoms, of which 15129 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 Elongin-B.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	104	Total	C	H	N	O	S	824	0	0
			1647	520	824	138	160	5			
1	D	104	Total	C	H	N	O	S	824	0	0
			1647	520	824	138	160	5			
1	G	104	Total	C	H	N	O	S	822	0	0
			1645	520	822	138	160	5			
1	J	104	Total	C	H	N	O	S	824	0	0
			1647	520	824	138	160	5			

- Molecule 2 is a protein called Elongin-C.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	87	Total	C	H	N	O	S	697	0	0
			1392	448	697	111	129	7			
2	E	88	Total	C	H	N	O	S	704	0	0
			1406	452	704	112	131	7			
2	H	94	Total	C	H	N	O	S	737	0	0
			1484	480	737	119	142	6			
2	K	87	Total	C	H	N	O	S	697	0	0
			1392	448	697	111	129	7			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	16	MET	-	initiating methionine	UNP Q15369
E	16	MET	-	initiating methionine	UNP Q15369
H	16	MET	-	initiating methionine	UNP Q15369
K	16	MET	-	initiating methionine	UNP Q15369

- Molecule 3 is a protein called von Hippel-Lindau disease tumor suppressor.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
3	C	143	Total	C	H	N	O	S	1170	0	0
			2339	744	1170	213	210	2			
3	F	147	Total	C	H	N	O	S	1205	0	0
			2407	764	1205	220	216	2			
3	I	151	Total	C	H	N	O	S	1233	0	0
			2469	782	1233	230	222	2			
3	L	148	Total	C	H	N	O	S	1217	0	0
			2432	772	1217	224	217	2			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	52	GLY	-	expression tag	UNP P40337
C	53	SER	-	expression tag	UNP P40337
F	52	GLY	-	expression tag	UNP P40337
F	53	SER	-	expression tag	UNP P40337
I	52	GLY	-	expression tag	UNP P40337
I	53	SER	-	expression tag	UNP P40337
L	52	GLY	-	expression tag	UNP P40337
L	53	SER	-	expression tag	UNP P40337

- Molecule 4 is a protein called Probable global transcription activator SNF2L2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
4	M	114	Total	C	H	N	O	S	964	0	0
			1900	595	964	165	173	3			
4	N	114	Total	C	H	N	O	S	968	0	0
			1904	595	968	165	173	3			
4	O	114	Total	C	H	N	O	S	968	0	0
			1904	595	968	165	173	3			
4	P	114	Total	C	H	N	O	S	967	0	0
			1903	595	967	165	173	3			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	1371	SER	-	expression tag	UNP P51531
M	1372	MET	-	expression tag	UNP P51531
N	1371	SER	-	expression tag	UNP P51531
N	1372	MET	-	expression tag	UNP P51531
O	1371	SER	-	expression tag	UNP P51531
O	1372	MET	-	expression tag	UNP P51531
P	1371	SER	-	expression tag	UNP P51531

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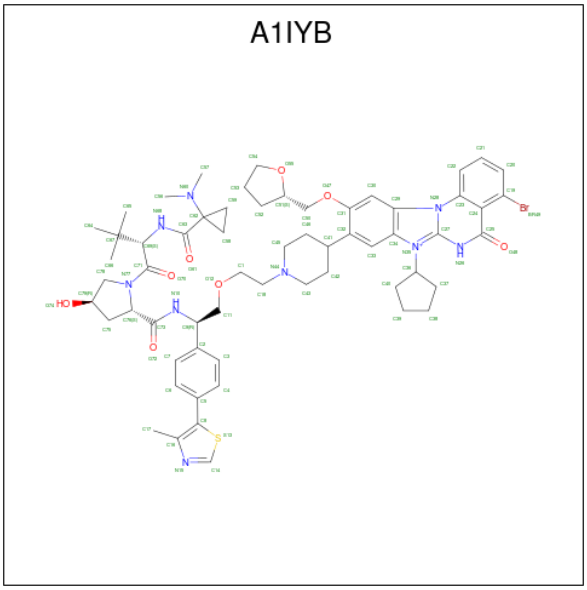
Chain	Residue	Modelled	Actual	Comment	Reference
P	1372	MET	-	expression tag	UNP P51531

- Molecule 5 is (2 {S},4 {R})- {N}-[(1 {R})-2-[2-[4-[4-bromanyl-7-cyclopentyl-5-oxidanylidene-10-[[(2 {S})-oxolan-2-yl]methoxy]-6 {H}-benzimidazolo[1,2-a]quinazolin-9-yl]piperidin-1-yl]ethoxy]-1-[4-(4-methyl-1,3-thiazol-5-yl)phenyl]ethyl]-1-[(2 {S})-2-[[1-(dimethylamino)cyclopropyl]carbonylamino]-3,3-dimethyl-butanoyl]-4-oxidanyl-pyrrolidine-2-carboxamide (CCD ID: A1IYB) (formula: $C_{60}H_{77}BrN_9O_8S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
5	C	1	Total	Br	C	H	N	O	S	77	0
			156	1	60	77	9	8	1		
5	F	1	Total	Br	C	H	N	O	S	77	0
			156	1	60	77	9	8	1		
5	I	1	Total	Br	C	H	N	O	S	77	0
			156	1	60	77	9	8	1		
5	L	1	Total	Br	C	H	N	O	S	77	0
			156	1	60	77	9	8	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	18	Total	O	0	0
			18	18		
6	B	26	Total	O	0	0
			26	26		
6	C	25	Total	O	0	0
			25	25		

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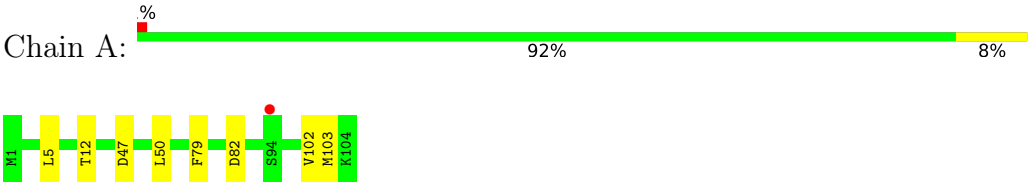
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	D	14	Total O 14 14	0	0
6	E	20	Total O 20 20	0	0
6	F	43	Total O 43 43	0	0
6	G	4	Total O 4 4	0	0
6	H	16	Total O 16 16	0	0
6	I	25	Total O 25 25	0	0
6	J	8	Total O 8 8	0	0
6	K	14	Total O 14 14	0	0
6	L	43	Total O 43 43	0	0
6	M	14	Total O 14 14	0	0
6	N	12	Total O 12 12	0	0
6	O	10	Total O 10 10	0	0
6	P	7	Total O 7 7	0	0

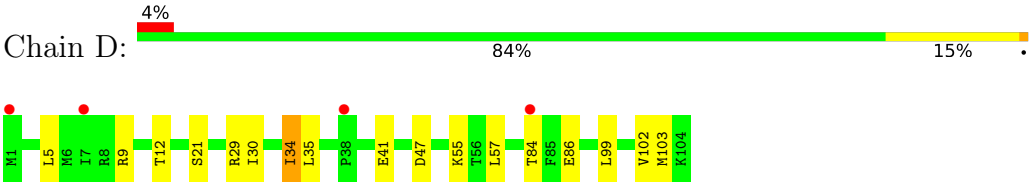
3 Residue-property plots (i)

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.

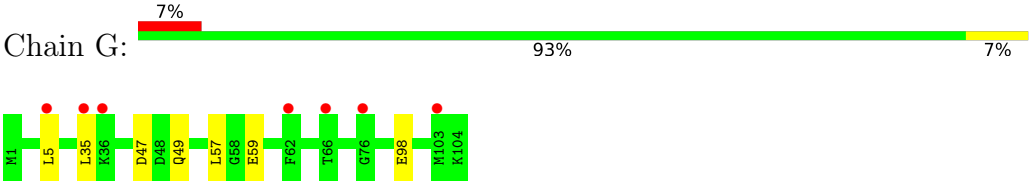
- Molecule 1: Elongin-B



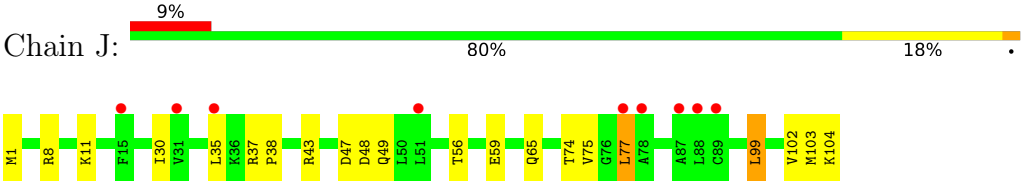
- Molecule 1: Elongin-B



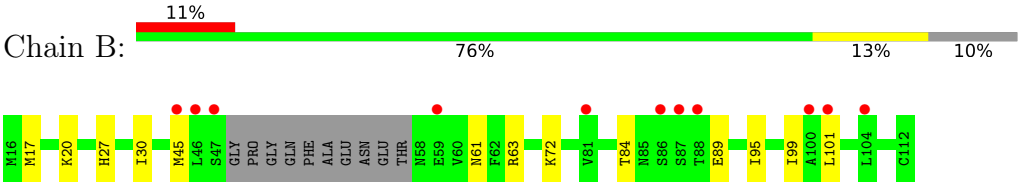
- Molecule 1: Elongin-B



- Molecule 1: Elongin-B

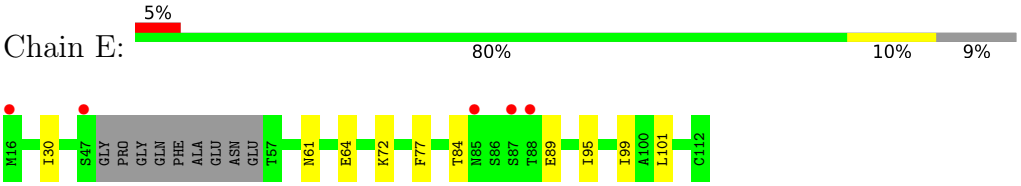


- Molecule 2: Elongin-C



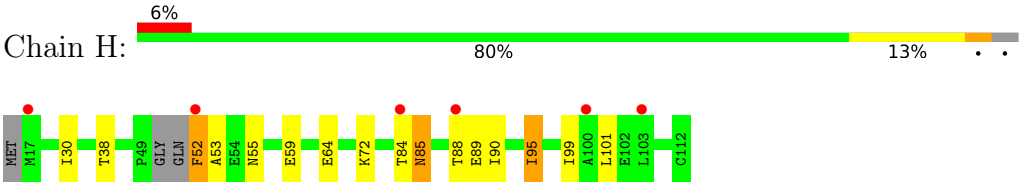
- Molecule 2: Elongin-C

Chain E:



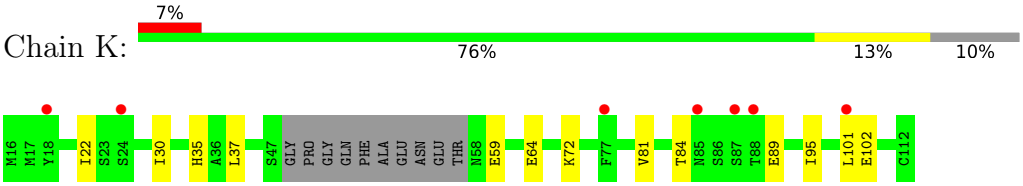
• Molecule 2: Elongin-C

Chain H:



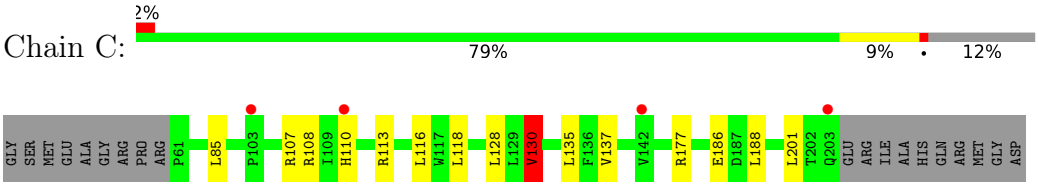
• Molecule 2: Elongin-C

Chain K:



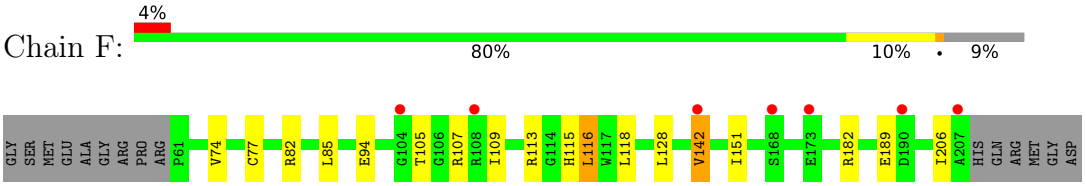
• Molecule 3: von Hippel-Lindau disease tumor suppressor

Chain C:



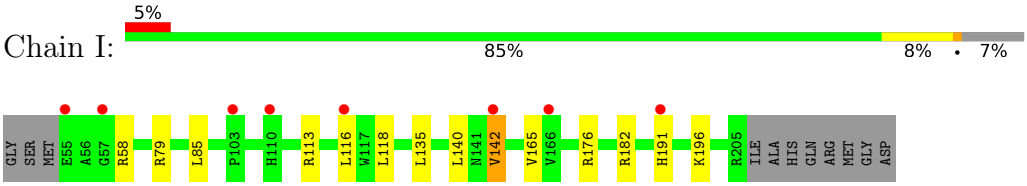
• Molecule 3: von Hippel-Lindau disease tumor suppressor

Chain F:



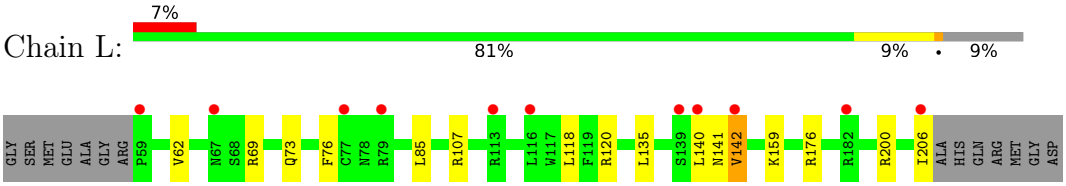
• Molecule 3: von Hippel-Lindau disease tumor suppressor

Chain I:



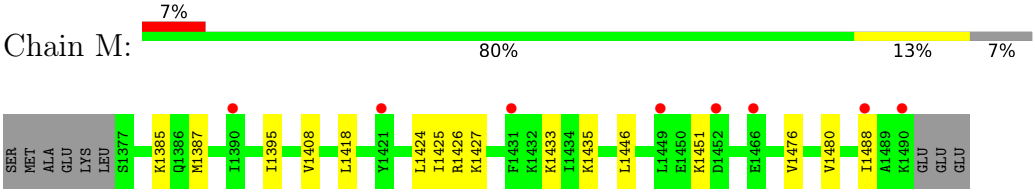
• Molecule 3: von Hippel-Lindau disease tumor suppressor

Chain L:



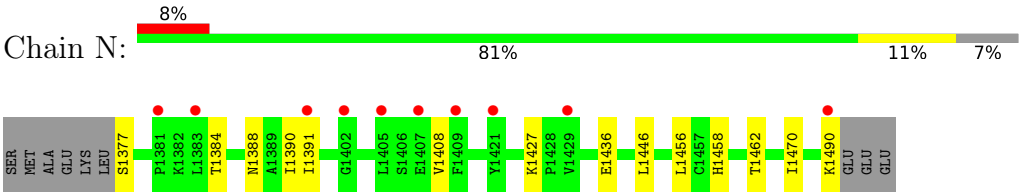
• Molecule 4: Probable global transcription activator SNF2L2

Chain M:



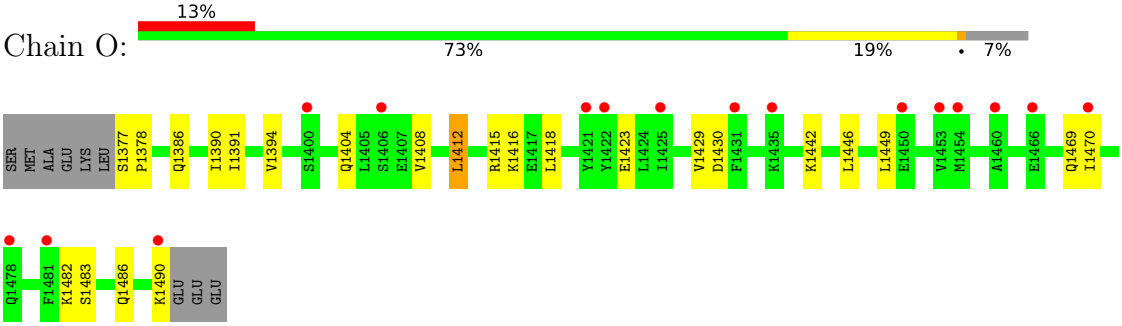
• Molecule 4: Probable global transcription activator SNF2L2

Chain N:



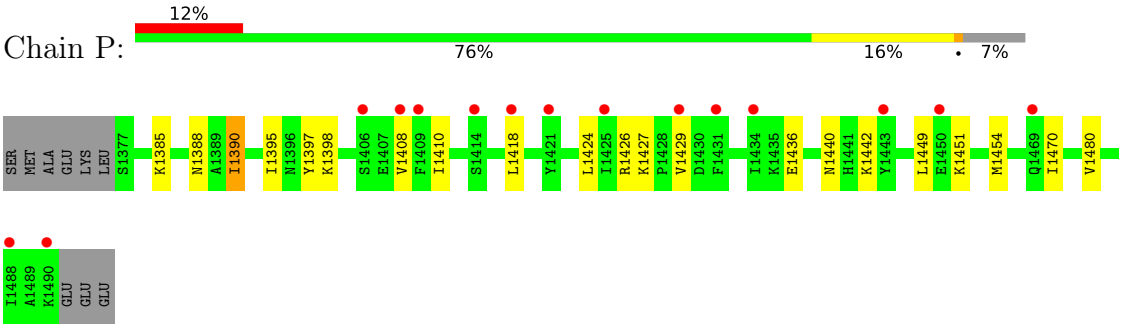
• Molecule 4: Probable global transcription activator SNF2L2

Chain O:



• Molecule 4: Probable global transcription activator SNF2L2

Chain P:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	108.38Å 78.54Å 171.57Å 90.00° 91.43° 90.00°	Depositor
Resolution (Å)	32.47 – 2.84 32.47 – 2.84	Depositor EDS
% Data completeness (in resolution range)	62.1 (32.47-2.84) 62.3 (32.47-2.84)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.60 (at 2.85Å)	Xtriage
Refinement program	BUSTER 2.11.7	Depositor
R, R_{free}	0.251 , 0.265 0.261 , 0.277	Depositor DCC
R_{free} test set	2061 reflections (4.82%)	wwPDB-VP
Wilson B-factor (Å^2)	62.2	Xtriage
Anisotropy	0.020	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 40.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.020 for h,-k,-l	Xtriage
F_o,F_c correlation	0.88	EDS
Total number of atoms	30441	wwPDB-VP
Average B, all atoms (Å^2)	73.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.12% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: A1IYB

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	0.76	0/839	0.97	1/1132 (0.1%)
1	D	0.75	0/839	0.97	0/1132
1	G	0.76	0/839	0.93	0/1132
1	J	0.81	0/839	1.03	1/1132 (0.1%)
2	B	0.77	0/709	1.02	0/955
2	E	0.76	0/716	1.02	1/965 (0.1%)
2	H	0.80	0/763	1.14	2/1030 (0.2%)
2	K	0.78	0/709	0.97	0/955
3	C	0.73	0/1200	1.00	2/1638 (0.1%)
3	F	0.74	0/1233	1.02	2/1682 (0.1%)
3	I	0.73	0/1268	1.00	0/1729
3	L	0.71	0/1247	1.01	1/1701 (0.1%)
4	M	0.79	0/952	1.04	0/1278
4	N	0.78	0/952	1.07	0/1278
4	O	0.84	0/952	1.08	0/1278
4	P	0.84	0/952	1.09	1/1278 (0.1%)
All	All	0.77	0/15009	1.02	11/20295 (0.1%)

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	85	ASN	CA-CB-CG	11.02	123.62	112.60
3	F	94	GLU	CB-CG-CD	7.32	125.04	112.60
4	P	1390	ILE	N-CA-CB	7.28	119.89	110.57
2	H	52	PHE	CA-CB-CG	6.80	120.60	113.80
3	C	130	VAL	CA-C-N	6.22	133.41	121.54

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	823	824	824	0	0
1	D	823	824	824	1	0
1	G	823	822	824	0	0
1	J	823	824	824	1	0
2	B	695	697	697	0	0
2	E	702	704	704	0	0
2	H	747	737	737	2	0
2	K	695	697	697	1	0
3	C	1169	1170	1170	0	0
3	F	1202	1205	1205	1	0
3	I	1236	1233	1235	1	0
3	L	1215	1217	1220	0	0
4	M	936	964	968	1	0
4	N	936	968	968	2	0
4	O	936	968	968	3	0
4	P	936	967	968	1	0
5	C	79	77	0	2	0
5	F	79	77	0	1	0
5	I	79	77	0	1	0
5	L	79	77	0	2	0
6	A	18	0	0	0	0
6	B	26	0	0	0	0
6	C	25	0	0	0	0
6	D	14	0	0	0	0
6	E	20	0	0	0	0
6	F	43	0	0	0	0
6	G	4	0	0	0	0
6	H	16	0	0	0	0
6	I	25	0	0	0	0
6	J	8	0	0	0	0
6	K	14	0	0	0	0
6	L	43	0	0	0	0
6	M	14	0	0	0	0
6	N	12	0	0	0	0
6	O	10	0	0	0	0
6	P	7	0	0	0	0
All	All	15312	15129	14833	17	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 1.

The worst 5 of 17 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:K:35:HIS:CD2	2:K:81:VAL:HG21	2.35	0.62
5:L:301:A1IYB:BR49	5:L:301:A1IYB:O48	2.75	0.59
5:I:1501:A1IYB:BR49	5:I:1501:A1IYB:O48	2.76	0.57
5:F:1501:A1IYB:O48	5:F:1501:A1IYB:BR49	2.78	0.56
5:C:1501:A1IYB:BR49	5:C:1501:A1IYB:O48	2.79	0.55

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	102/104 (98%)	95 (93%)	5 (5%)	2 (2%)	6 13
1	D	102/104 (98%)	95 (93%)	6 (6%)	1 (1%)	13 25
1	G	102/104 (98%)	96 (94%)	5 (5%)	1 (1%)	13 25
1	J	102/104 (98%)	91 (89%)	8 (8%)	3 (3%)	3 8
2	B	83/97 (86%)	80 (96%)	2 (2%)	1 (1%)	11 22
2	E	84/97 (87%)	80 (95%)	3 (4%)	1 (1%)	11 22
2	H	90/97 (93%)	83 (92%)	5 (6%)	2 (2%)	5 11
2	K	83/97 (86%)	79 (95%)	3 (4%)	1 (1%)	11 22
3	C	141/162 (87%)	128 (91%)	12 (8%)	1 (1%)	19 36
3	F	145/162 (90%)	135 (93%)	8 (6%)	2 (1%)	9 19
3	I	149/162 (92%)	134 (90%)	13 (9%)	2 (1%)	10 20
3	L	146/162 (90%)	134 (92%)	11 (8%)	1 (1%)	19 36

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	M	112/123 (91%)	111 (99%)	1 (1%)	0	100	100
4	N	112/123 (91%)	110 (98%)	2 (2%)	0	100	100
4	O	112/123 (91%)	109 (97%)	3 (3%)	0	100	100
4	P	112/123 (91%)	111 (99%)	1 (1%)	0	100	100
All	All	1777/1944 (91%)	1671 (94%)	88 (5%)	18 (1%)	13	25

5 of 18 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	F	116	LEU
2	H	89	GLU
3	I	142	VAL
3	L	142	VAL
2	H	53	ALA

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	92/92 (100%)	87 (95%)	5 (5%)	18	37
1	D	92/92 (100%)	76 (83%)	16 (17%)	1	2
1	G	92/92 (100%)	86 (94%)	6 (6%)	14	29
1	J	92/92 (100%)	75 (82%)	17 (18%)	1	1
2	B	79/86 (92%)	67 (85%)	12 (15%)	2	4
2	E	80/86 (93%)	72 (90%)	8 (10%)	6	13
2	H	84/86 (98%)	71 (84%)	13 (16%)	2	3
2	K	79/86 (92%)	69 (87%)	10 (13%)	3	7
3	C	134/148 (90%)	119 (89%)	15 (11%)	5	10
3	F	137/148 (93%)	122 (89%)	15 (11%)	5	10
3	I	140/148 (95%)	128 (91%)	12 (9%)	8	18
3	L	139/148 (94%)	124 (89%)	15 (11%)	5	11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
4	M	107/115 (93%)	93 (87%)	14 (13%)	3 6
4	N	107/115 (93%)	96 (90%)	11 (10%)	6 12
4	O	107/115 (93%)	88 (82%)	19 (18%)	1 2
4	P	107/115 (93%)	88 (82%)	19 (18%)	1 2
All	All	1668/1764 (95%)	1461 (88%)	207 (12%)	4 7

5 of 207 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	J	77	LEU
3	L	206	ILE
4	P	1429	VAL
2	K	22	ILE
3	L	69	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
4	N	1396	ASN
4	N	1458	HIS
4	P	1396	ASN
4	O	1459	ASN
4	O	1469	GLN

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)

4 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	$\#\|Z\| > 2$
5	A1IYB	L	301	-	76,89,89	0.58	2 (2%)	99,133,133	0.83	2 (2%)
5	A1IYB	C	1501	-	76,89,89	0.68	2 (2%)	99,133,133	1.33	6 (6%)
5	A1IYB	F	1501	-	76,89,89	0.62	2 (2%)	99,133,133	1.21	9 (9%)
5	A1IYB	I	1501	-	76,89,89	0.61	2 (2%)	99,133,133	0.99	6 (6%)

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
5	A1IYB	L	301	-	-	5/59/106/106	0/10/11/11
5	A1IYB	C	1501	-	-	15/59/106/106	0/10/11/11
5	A1IYB	F	1501	-	-	18/59/106/106	0/10/11/11
5	A1IYB	I	1501	-	-	8/59/106/106	0/10/11/11

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	1501	A1IYB	C24-C23	2.49	1.42	1.39
5	F	1501	A1IYB	C24-C23	2.33	1.42	1.39
5	L	301	A1IYB	C24-C23	2.26	1.42	1.39
5	I	1501	A1IYB	C24-C23	2.23	1.42	1.39
5	F	1501	A1IYB	C33-C32	2.16	1.40	1.36

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	1501	A1IYB	C31-C32-C41	6.64	127.67	120.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	F	1501	A1IYB	O47-C31-C30	-5.72	115.51	125.19
5	C	1501	A1IYB	O47-C31-C30	-5.29	116.24	125.19
5	I	1501	A1IYB	C22-C23-C24	-4.61	119.55	122.21
5	L	301	A1IYB	C22-C23-C24	-4.48	119.62	122.21

There are no chirality outliers.

5 of 46 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	1501	A1IYB	O12-C11-C9-C2
5	C	1501	A1IYB	O12-C11-C9-N10
5	C	1501	A1IYB	C58-C62-N60-C56
5	C	1501	A1IYB	C59-C62-N60-C56
5	C	1501	A1IYB	C64-C67-C69-N68

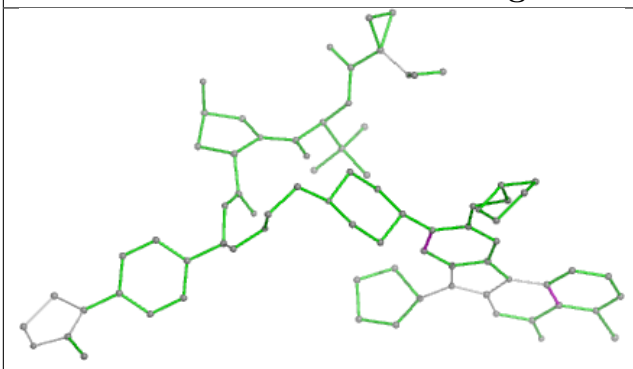
There are no ring outliers.

4 monomers are involved in 6 short contacts:

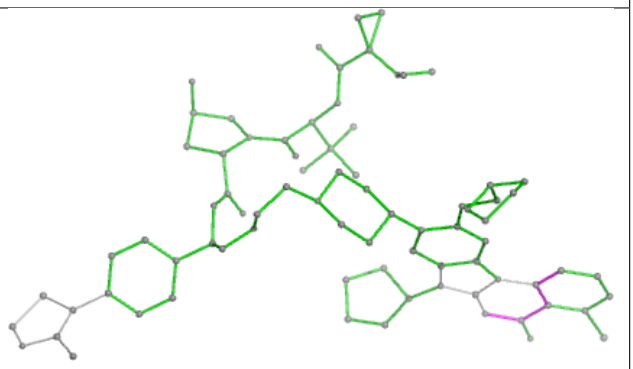
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	L	301	A1IYB	2	0
5	C	1501	A1IYB	2	0
5	F	1501	A1IYB	1	0
5	I	1501	A1IYB	1	0

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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

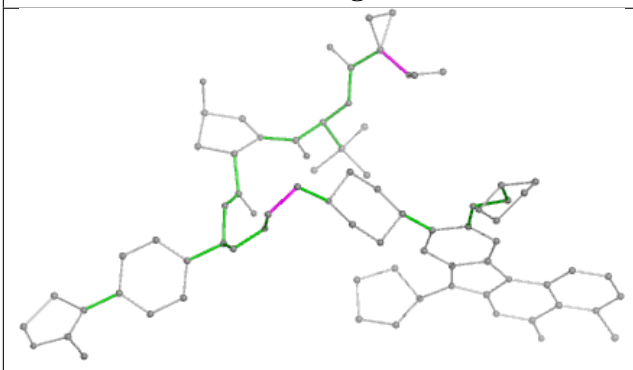
Ligand A1IYB L 301



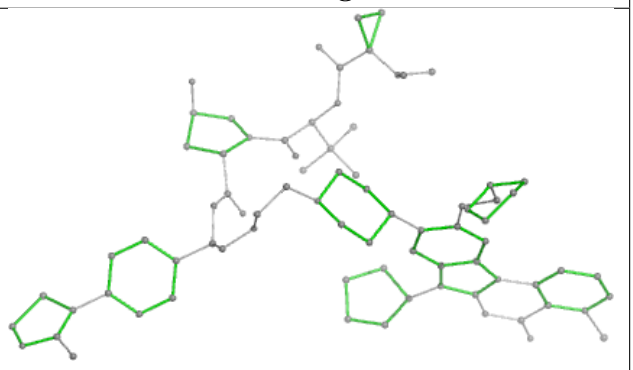
Bond lengths



Bond angles

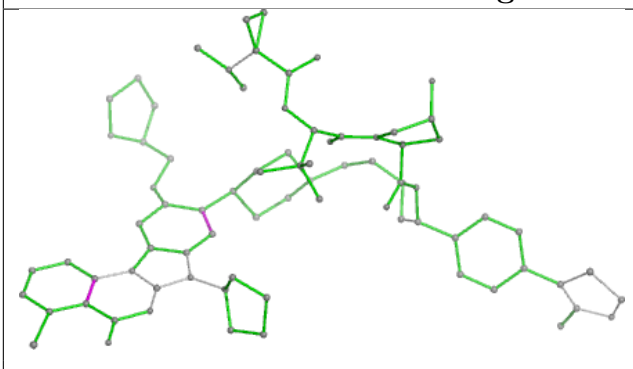


Torsions



Rings

Ligand A1IYB C 1501



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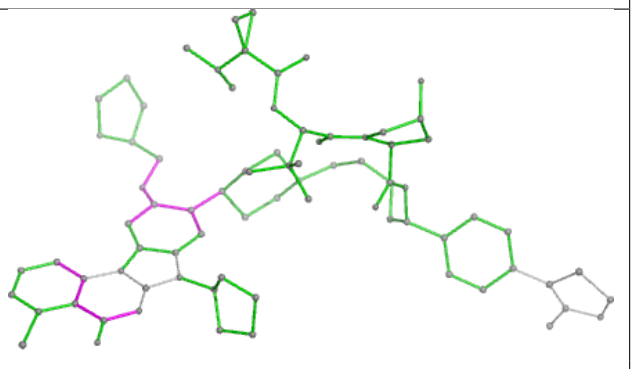
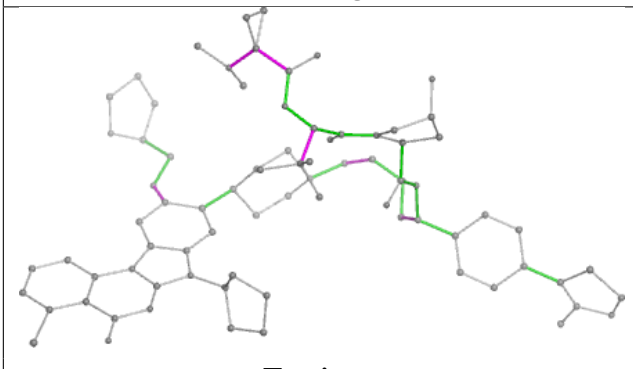


Bond angles



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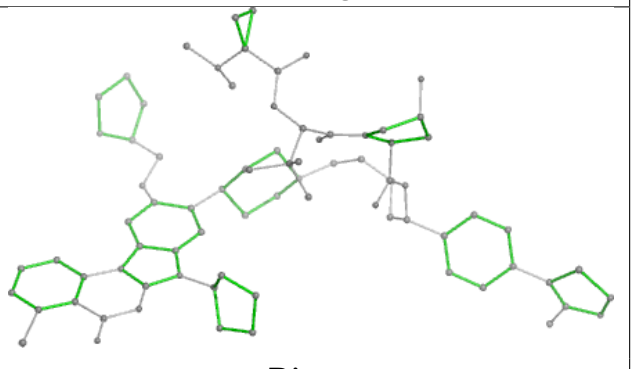
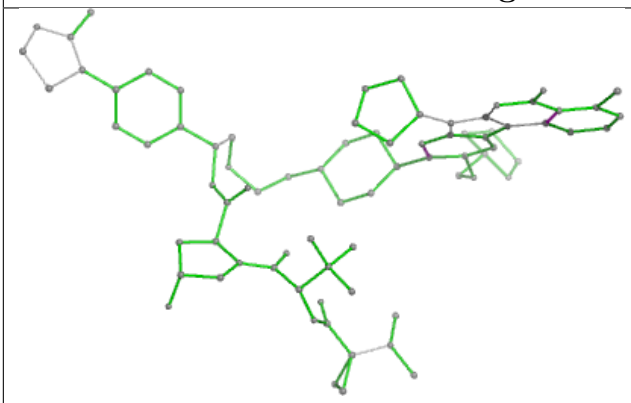
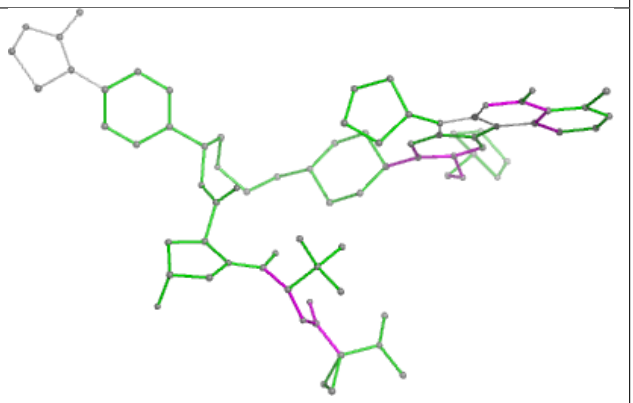


Rings

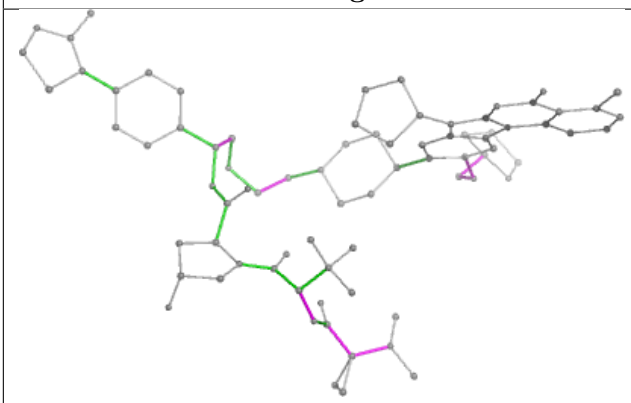
Ligand A1IYB F 1501



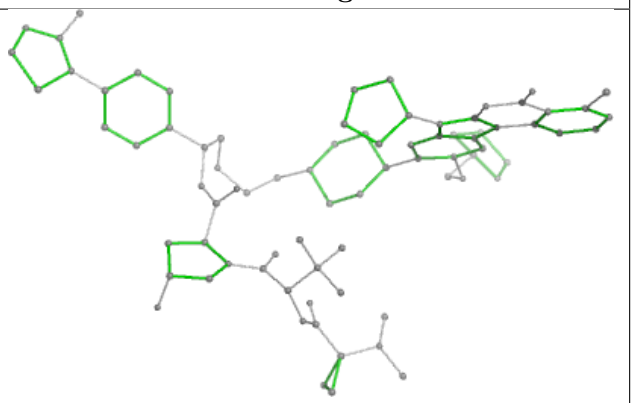
Bond lengths



Bond angles

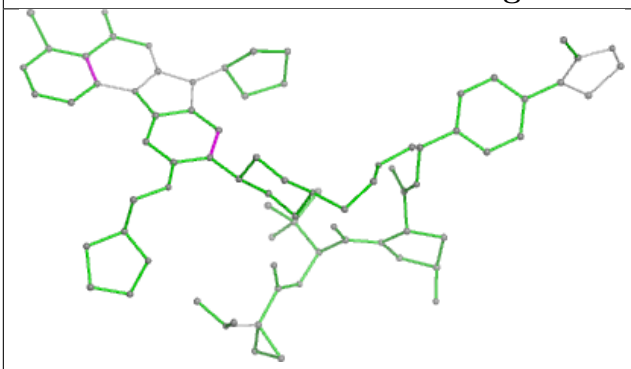


Torsions



Rings

Ligand A1IYB I 1501



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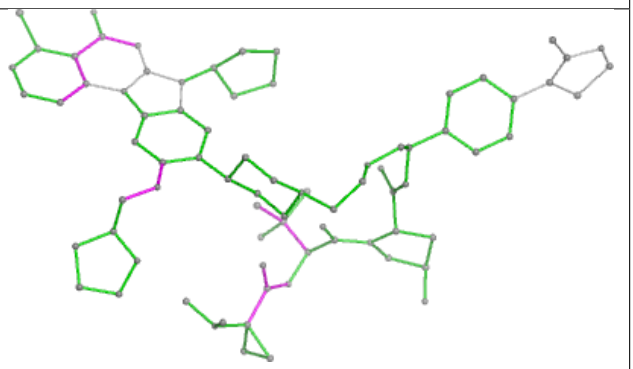
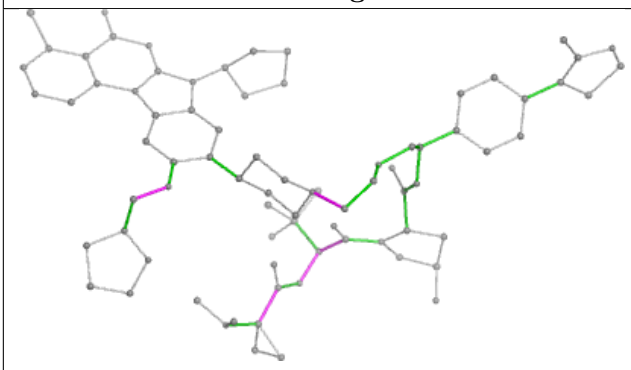
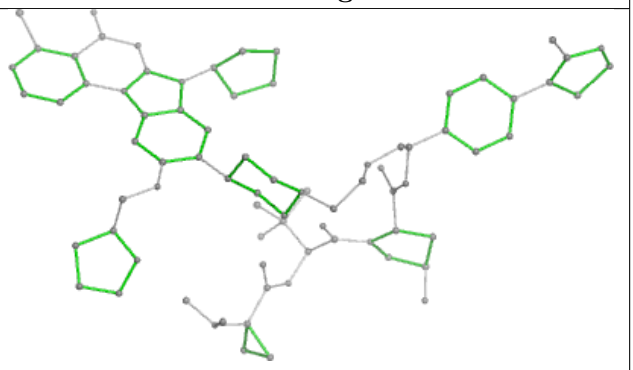


Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	104/104 (100%)	0.47	1 (0%) 79 77	16, 29, 47, 66	0
1	D	104/104 (100%)	0.58	4 (3%) 44 38	22, 36, 53, 62	0
1	G	104/104 (100%)	0.73	7 (6%) 25 21	23, 41, 61, 75	0
1	J	104/104 (100%)	0.98	9 (8%) 17 15	31, 45, 68, 85	0
2	B	87/97 (89%)	0.89	11 (12%) 9 8	16, 30, 45, 59	0
2	E	88/97 (90%)	0.74	5 (5%) 30 26	17, 28, 44, 49	0
2	H	94/97 (96%)	0.70	6 (6%) 27 23	17, 28, 43, 51	0
2	K	87/97 (89%)	0.81	7 (8%) 20 16	21, 38, 55, 65	0
3	C	143/162 (88%)	0.51	4 (2%) 55 50	18, 31, 48, 57	0
3	F	147/162 (90%)	0.57	7 (4%) 36 32	12, 24, 42, 52	0
3	I	151/162 (93%)	0.59	8 (5%) 33 28	14, 29, 56, 69	0
3	L	148/162 (91%)	0.72	11 (7%) 22 18	18, 30, 47, 55	0
4	M	114/123 (92%)	0.71	8 (7%) 24 19	19, 36, 55, 74	0
4	N	114/123 (92%)	1.03	10 (8%) 17 15	25, 42, 57, 67	0
4	O	114/123 (92%)	1.26	16 (14%) 7 6	33, 50, 68, 76	0
4	P	114/123 (92%)	1.17	15 (13%) 8 7	38, 54, 71, 81	0
All	All	1817/1944 (93%)	0.77	129 (7%) 23 19	12, 35, 60, 85	0

The worst 5 of 129 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	L	77	CYS	5.5
4	N	1381	PRO	5.5
3	L	140	LEU	4.8
2	E	88	THR	4.7
2	H	52	PHE	4.5

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

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

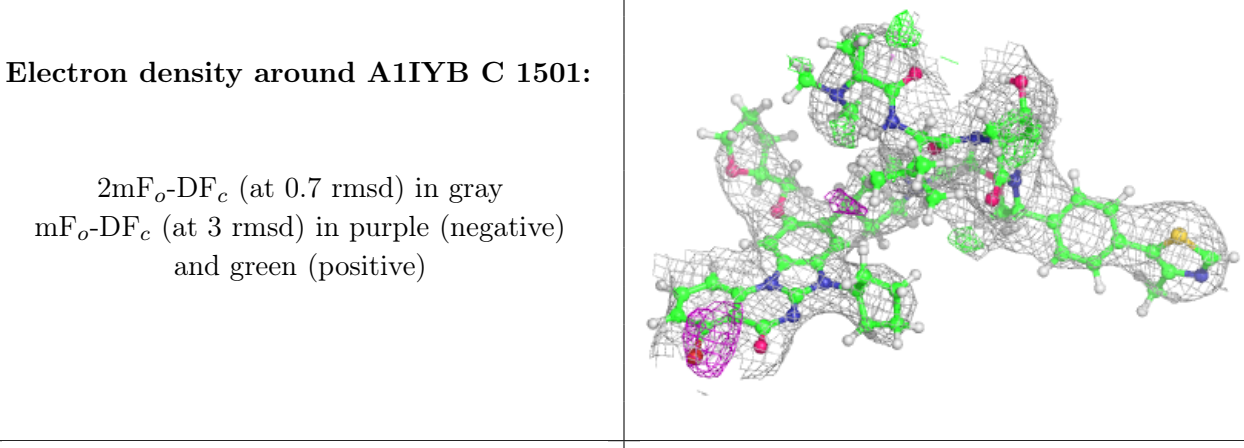
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

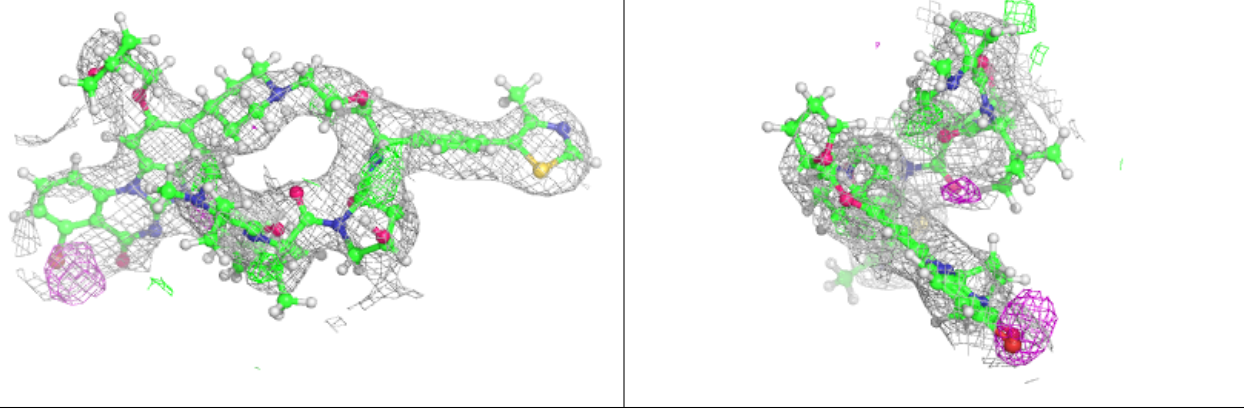
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	A1IYB	C	1501	79/79	0.87	0.14	62,74,92,94	77
5	A1IYB	I	1501	79/79	0.90	0.14	52,61,89,90	77
5	A1IYB	F	1501	79/79	0.91	0.13	45,51,66,69	77
5	A1IYB	L	301	79/79	0.91	0.14	51,57,77,78	77

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 A1IYB C 1501:

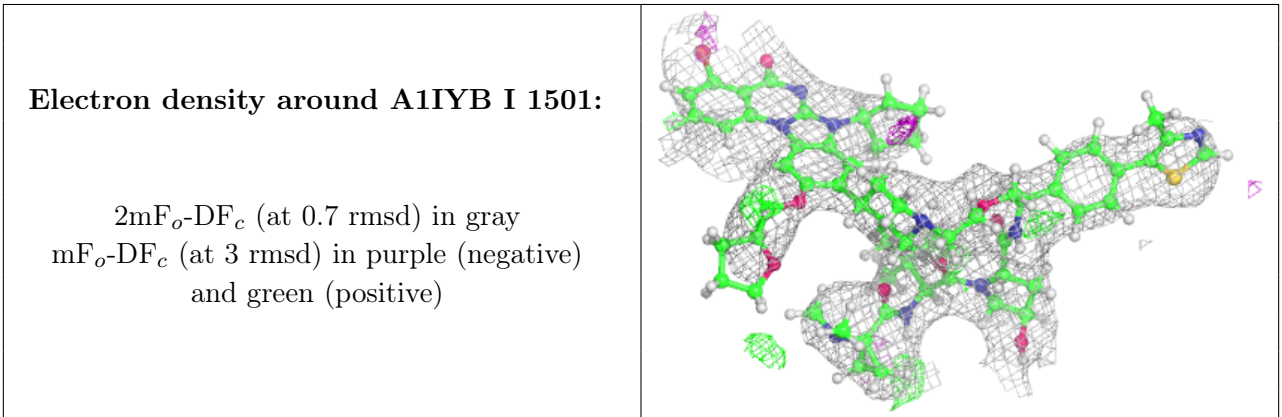
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

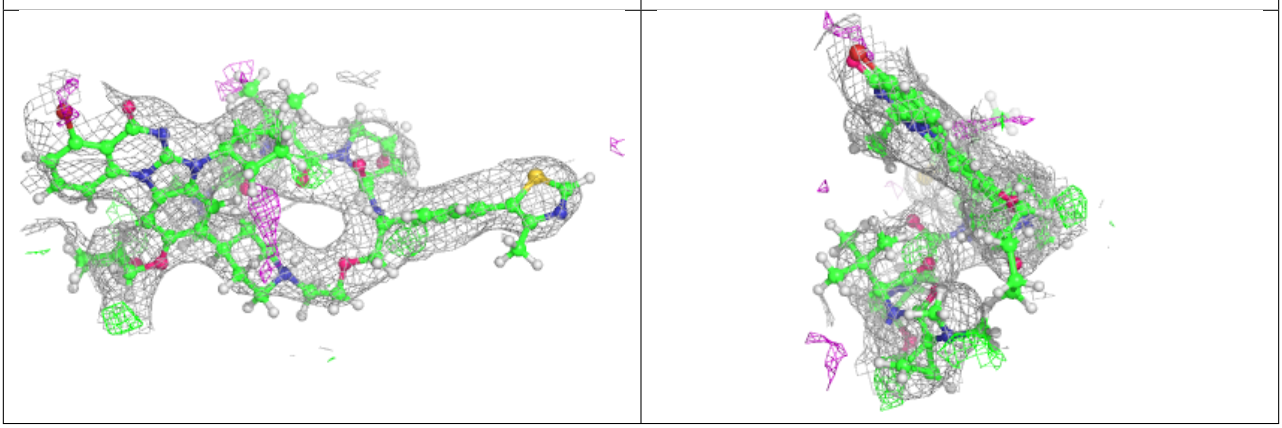




Electron density around A1IYB I 1501:

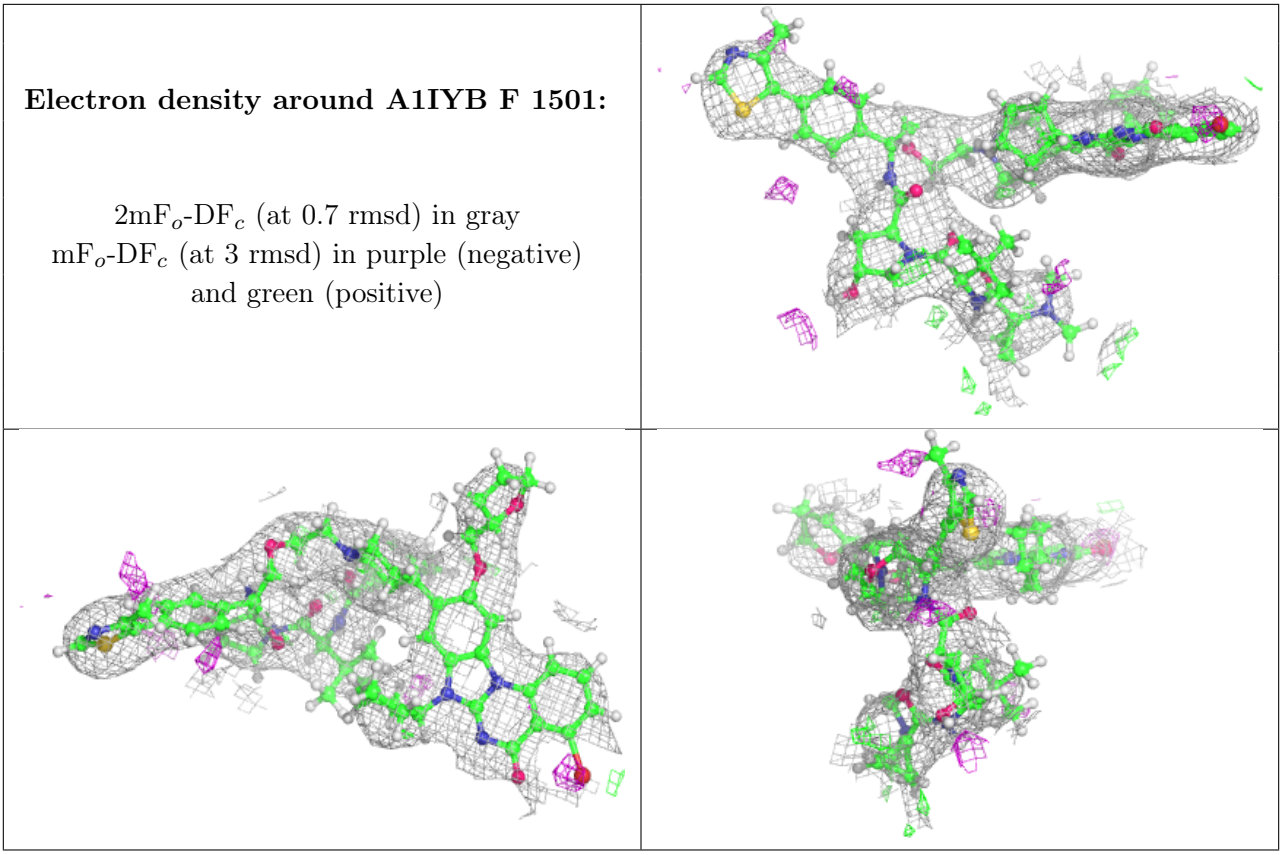
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





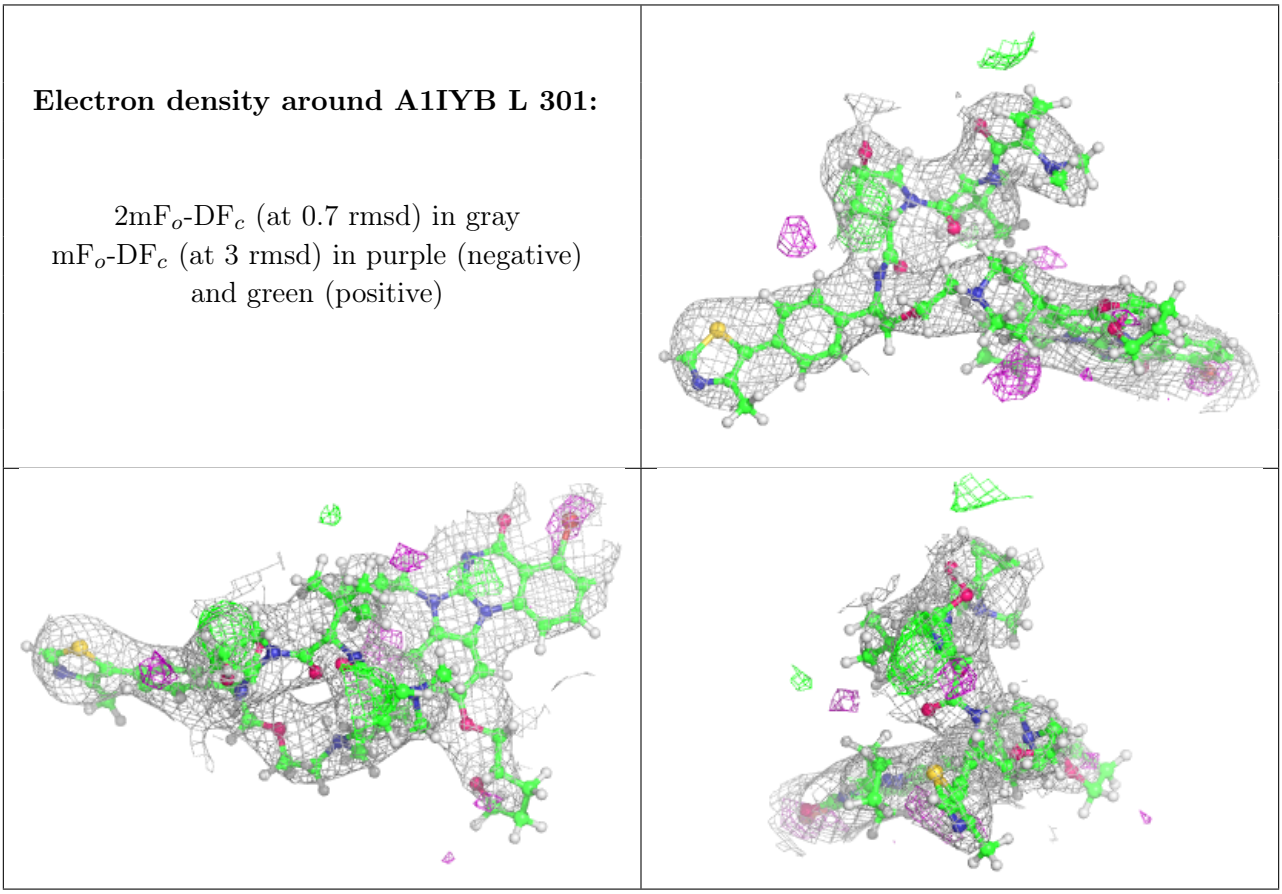
Electron density around A1IYB F 1501:

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



Electron density around A1IYB L 301:

$2mF_o$-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.