wwPDB X-ray Structure Validation Summary Report (i)

Jun 12, 2024 – 09:01 PM EDT

PDB ID	:	3OGL
Title	:	Structure of COI1-ASK1 in complex with JA-isoleucine and the JAZ1 degron
Authors	:	Sheard, L.B.; Tan, X.; Mao, H.; Withers, J.; Ben-Nissan, G.; Hinds, T.R.; Hsu, F.; Sharon, M.; Browse, J.; He, S.Y.; Rizo, J.; Howe, G.A.; Zheng, N.
Deposited on	:	2010-08-17
Resolution	:	3.18 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:

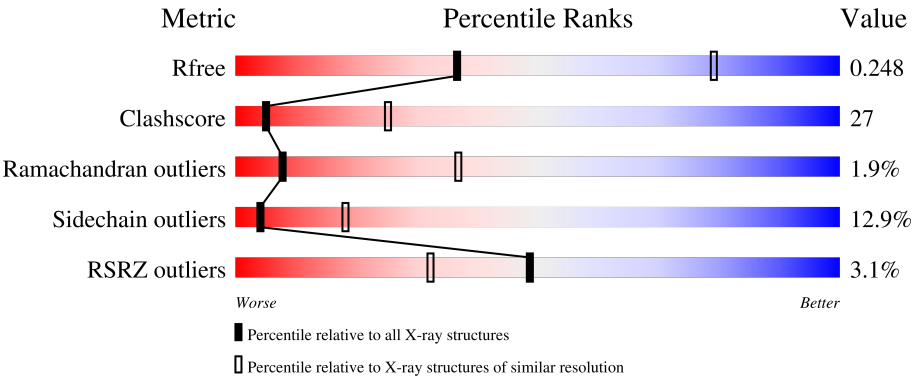
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.36.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 3.18 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1467 (3.20-3.16)
Clashscore	141614	1599 (3.20-3.16)
Ramachandran outliers	138981	1574 (3.20-3.16)
Sidechain outliers	138945	1573 (3.20-3.16)
RSRZ outliers	127900	1423 (3.20-3.16)

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	160	2% 49% 36% 5% 10%
1	C	160	5% 49% 34% 6% 10%
1	E	160	54% 29% 7% 10%
1	G	160	52% 31% 7% 10%
1	I	160	5% 48% 34% 8% • 10%

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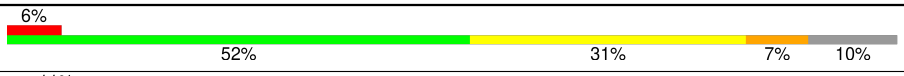
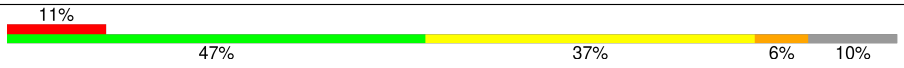
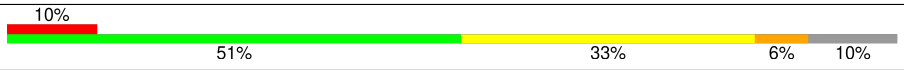
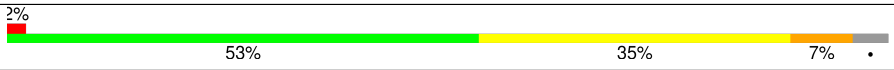
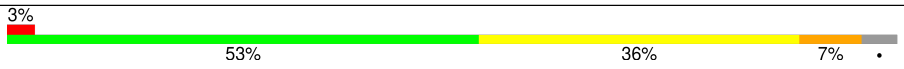
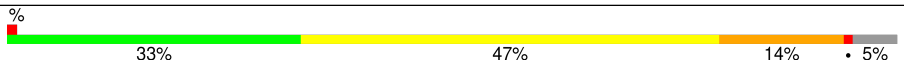
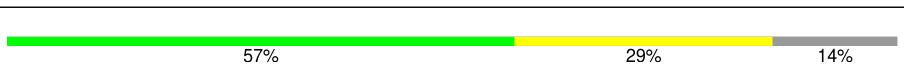
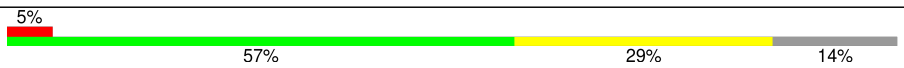
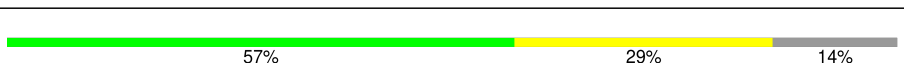
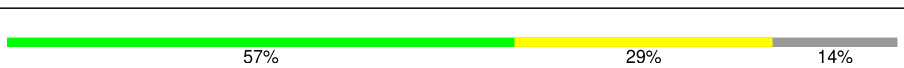
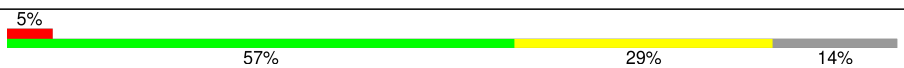
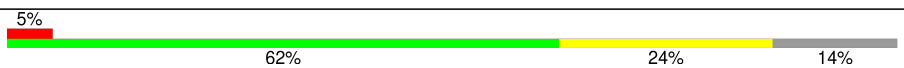
Mol	Chain	Length	Quality of chain
1	K	160	
1	M	160	
1	O	160	
2	B	592	
2	D	592	
2	F	592	
2	H	592	
2	J	592	
2	L	592	
2	N	592	
2	P	592	
3	Q	21	
3	R	21	
3	S	21	
3	U	21	
3	V	21	
3	W	21	
3	X	21	

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
4	7JA	B	1100	-	-	X	-
4	7JA	D	1100	-	-	X	-
4	7JA	F	1100	-	-	X	-
4	7JA	H	1100	-	-	X	-
4	7JA	J	1100	-	-	X	-
4	7JA	L	1100	-	-	X	-
4	7JA	N	1100	-	-	X	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	7JA	P	1100	-	-	X	-
5	PO4	B	1101	-	X	-	-
5	PO4	B	1102	-	X	-	-
5	PO4	B	1103	-	X	X	-
5	PO4	B	1104	-	X	-	-
5	PO4	D	1101	-	X	-	-
5	PO4	D	1102	-	X	-	-
5	PO4	D	1103	-	X	X	-
5	PO4	F	1101	-	X	-	-
5	PO4	F	1102	-	X	-	-
5	PO4	F	1103	-	X	X	-
5	PO4	F	1104	-	X	-	-
5	PO4	H	1101	-	X	-	-
5	PO4	H	1102	-	X	-	-
5	PO4	H	1103	-	X	X	-
5	PO4	H	1104	-	X	-	-
5	PO4	J	1101	-	X	-	-
5	PO4	J	1102	-	X	-	-
5	PO4	J	1103	-	X	X	-
5	PO4	J	1104	-	X	-	-
5	PO4	L	1101	-	X	-	-
5	PO4	L	1102	-	X	-	-
5	PO4	L	1103	-	X	X	-
5	PO4	L	1104	-	X	-	-
5	PO4	N	1101	-	X	-	-
5	PO4	N	1102	-	X	-	-
5	PO4	N	1103	-	X	X	-
5	PO4	N	1104	-	X	-	-
5	PO4	P	1101	-	X	-	-
5	PO4	P	1102	-	X	-	-
5	PO4	P	1103	-	X	X	-
5	PO4	P	1104	-	X	-	-

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 46877 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 SKP1-like protein 1A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	C	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	E	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	G	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	I	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	K	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	M	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			
1	O	144	Total	C	N	O	S	0	0	0
			1146	720	185	235	6			

- Molecule 2 is a protein called Coronatine-insensitive protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			
2	D	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			
2	F	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			
2	H	562	Total	C	N	O	S	0	0	0
			4486	2840	779	831	36			
2	J	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			
2	L	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			

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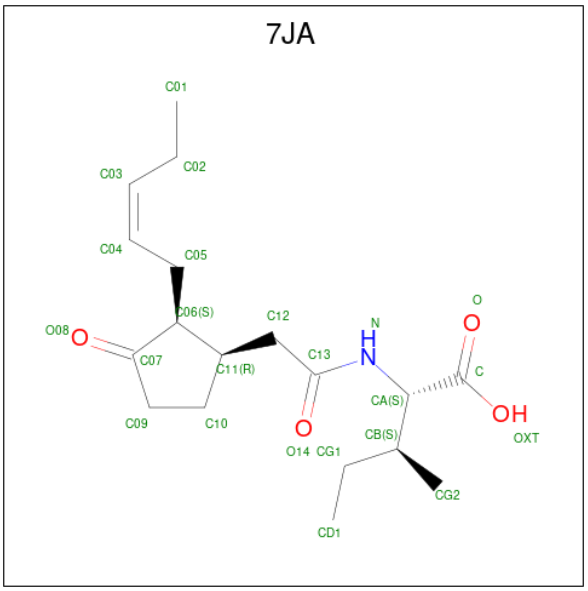
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	N	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			
2	P	568	Total	C	N	O	S	0	0	0
			4541	2873	790	842	36			

- Molecule 3 is a protein called JAZ1 incomplete degron peptide.

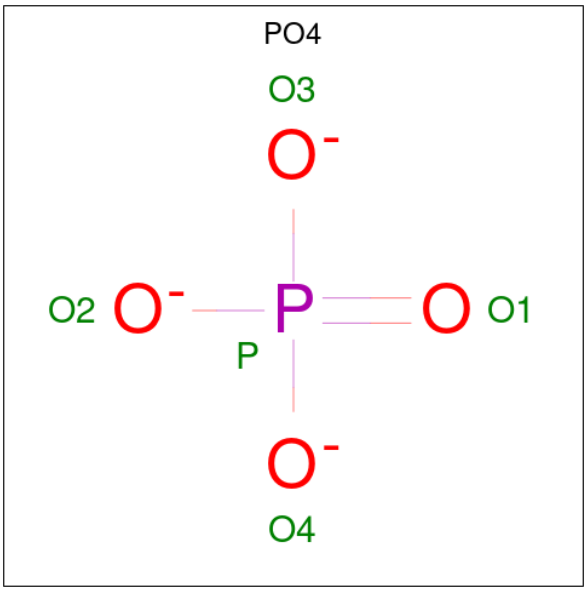
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	Q	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	R	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	S	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	U	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	V	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	W	18	Total	C	N	O	0	0	0
			156	99	34	23			
3	X	18	Total	C	N	O	0	0	0
			156	99	34	23			

- Molecule 4 is N-({(1R,2S)-3-oxo-2-[(2Z)-pent-2-en-1-yl]cyclopentyl}acetyl)-L-isoleucine (three-letter code: 7JA) (formula: $C_{18}H_{29}NO_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C N O 23 18 1 4	0	0
4	D	1	Total C N O 23 18 1 4	0	0
4	F	1	Total C N O 23 18 1 4	0	0
4	H	1	Total C N O 23 18 1 4	0	0
4	J	1	Total C N O 23 18 1 4	0	0
4	L	1	Total C N O 23 18 1 4	0	0
4	N	1	Total C N O 23 18 1 4	0	0
4	P	1	Total C N O 23 18 1 4	0	0

- Molecule 5 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total O P 5 4 1	0	0
5	B	1	Total O P 5 4 1	0	0
5	B	1	Total O P 5 4 1	0	0
5	B	1	Total O P 5 4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	D	1	Total O P 5 4 1	0	0
5	D	1	Total O P 5 4 1	0	0
5	D	1	Total O P 5 4 1	0	0
5	D	1	Total O P 5 4 1	0	0
5	F	1	Total O P 5 4 1	0	0
5	F	1	Total O P 5 4 1	0	0
5	F	1	Total O P 5 4 1	0	0
5	F	1	Total O P 5 4 1	0	0
5	H	1	Total O P 5 4 1	0	0
5	H	1	Total O P 5 4 1	0	0
5	H	1	Total O P 5 4 1	0	0
5	H	1	Total O P 5 4 1	0	0
5	J	1	Total O P 5 4 1	0	0
5	J	1	Total O P 5 4 1	0	0
5	J	1	Total O P 5 4 1	0	0
5	J	1	Total O P 5 4 1	0	0
5	L	1	Total O P 5 4 1	0	0
5	L	1	Total O P 5 4 1	0	0
5	L	1	Total O P 5 4 1	0	0
5	L	1	Total O P 5 4 1	0	0
5	N	1	Total O P 5 4 1	0	0

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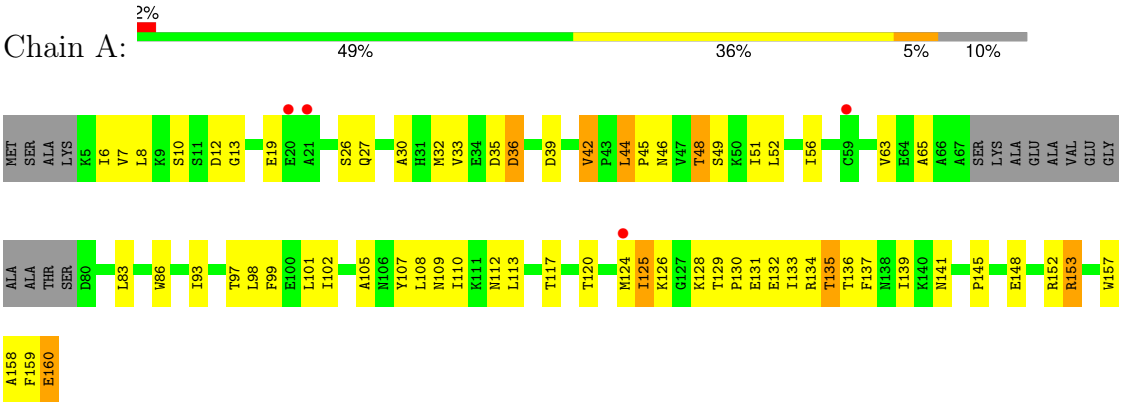
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	N	1	Total O P 5 4 1	0	0
5	N	1	Total O P 5 4 1	0	0
5	N	1	Total O P 5 4 1	0	0
5	P	1	Total O P 5 4 1	0	0
5	P	1	Total O P 5 4 1	0	0
5	P	1	Total O P 5 4 1	0	0
5	P	1	Total O P 5 4 1	0	0

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.

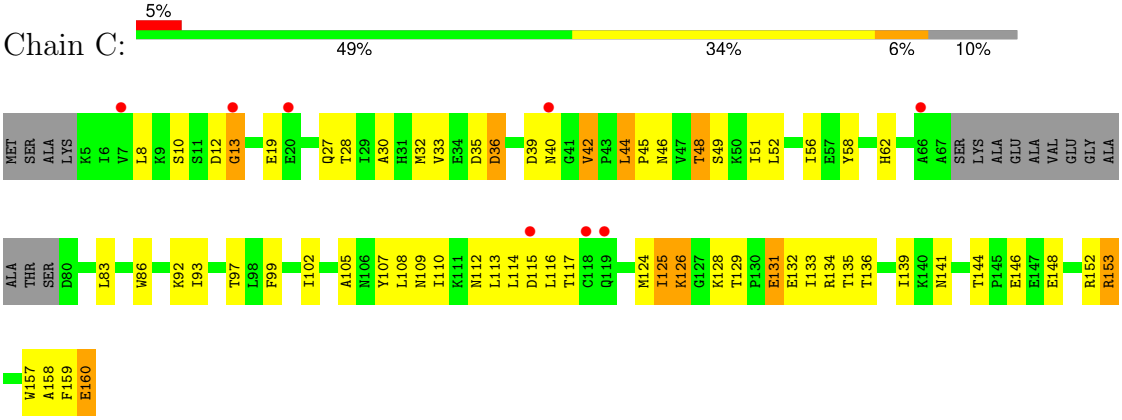
• Molecule 1: SKP1-like protein 1A

Chain A:



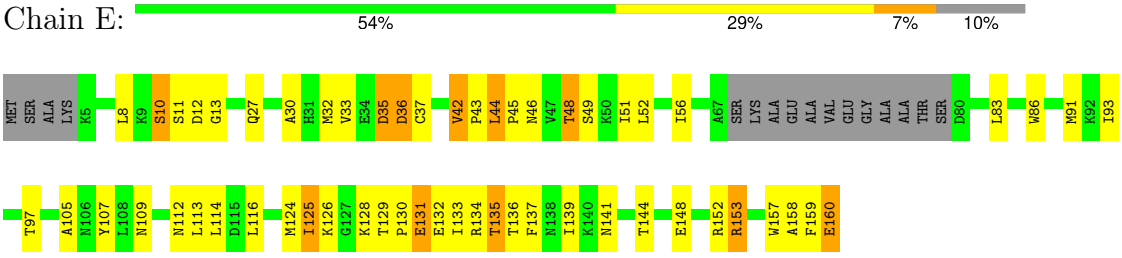
• Molecule 1: SKP1-like protein 1A

Chain C:



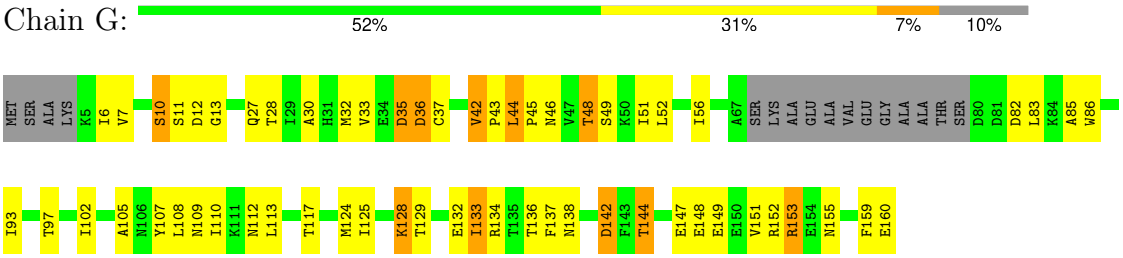
• Molecule 1: SKP1-like protein 1A

Chain E:



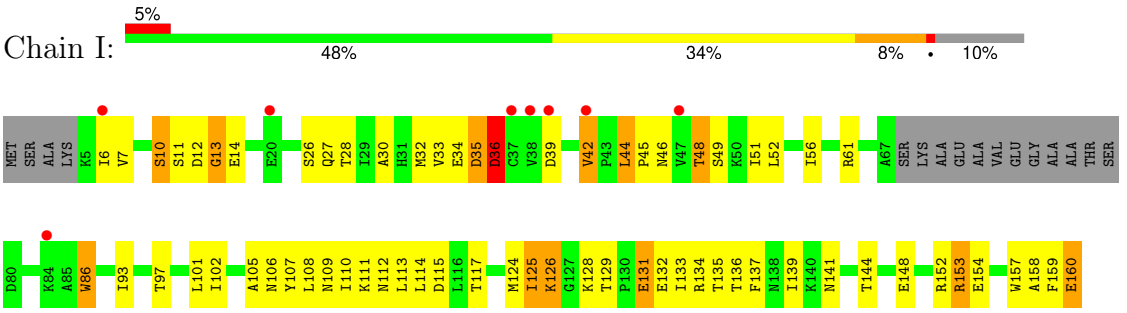
• Molecule 1: SKP1-like protein 1A

Chain G:



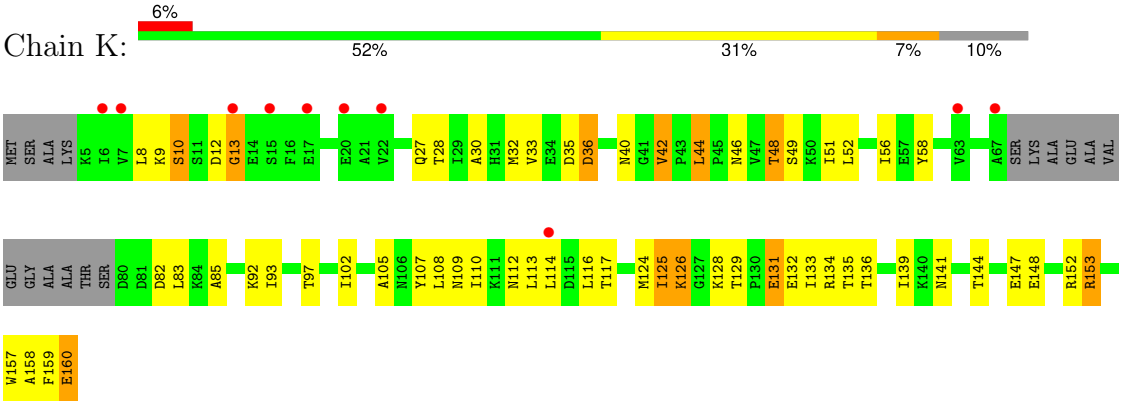
• Molecule 1: SKP1-like protein 1A

Chain I:



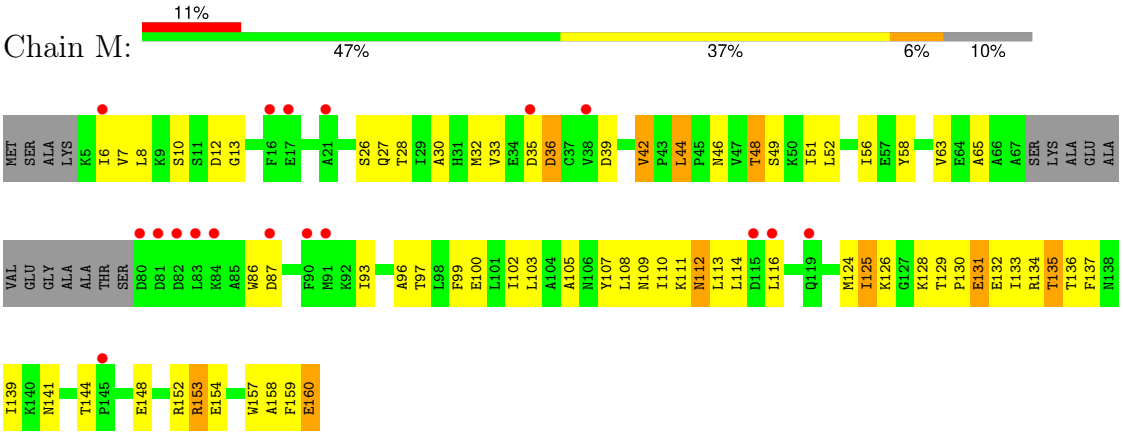
• Molecule 1: SKP1-like protein 1A

Chain K:



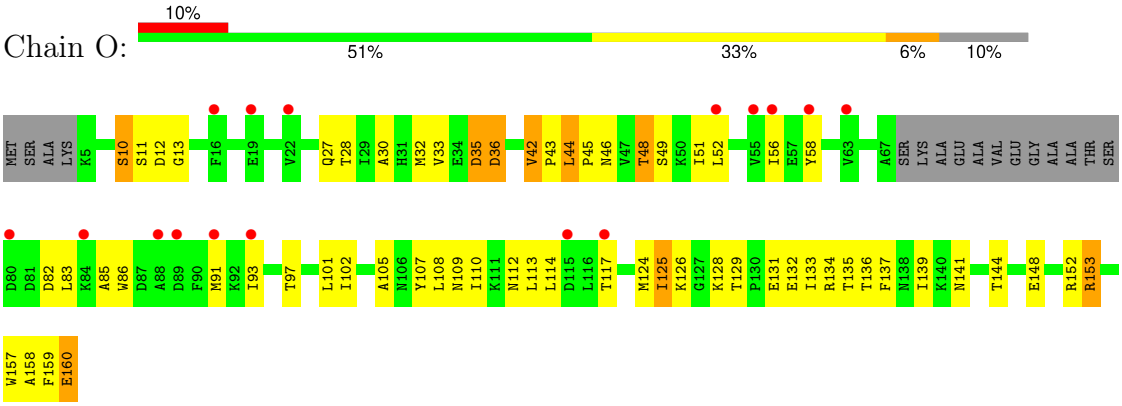
• Molecule 1: SKP1-like protein 1A

Chain M:



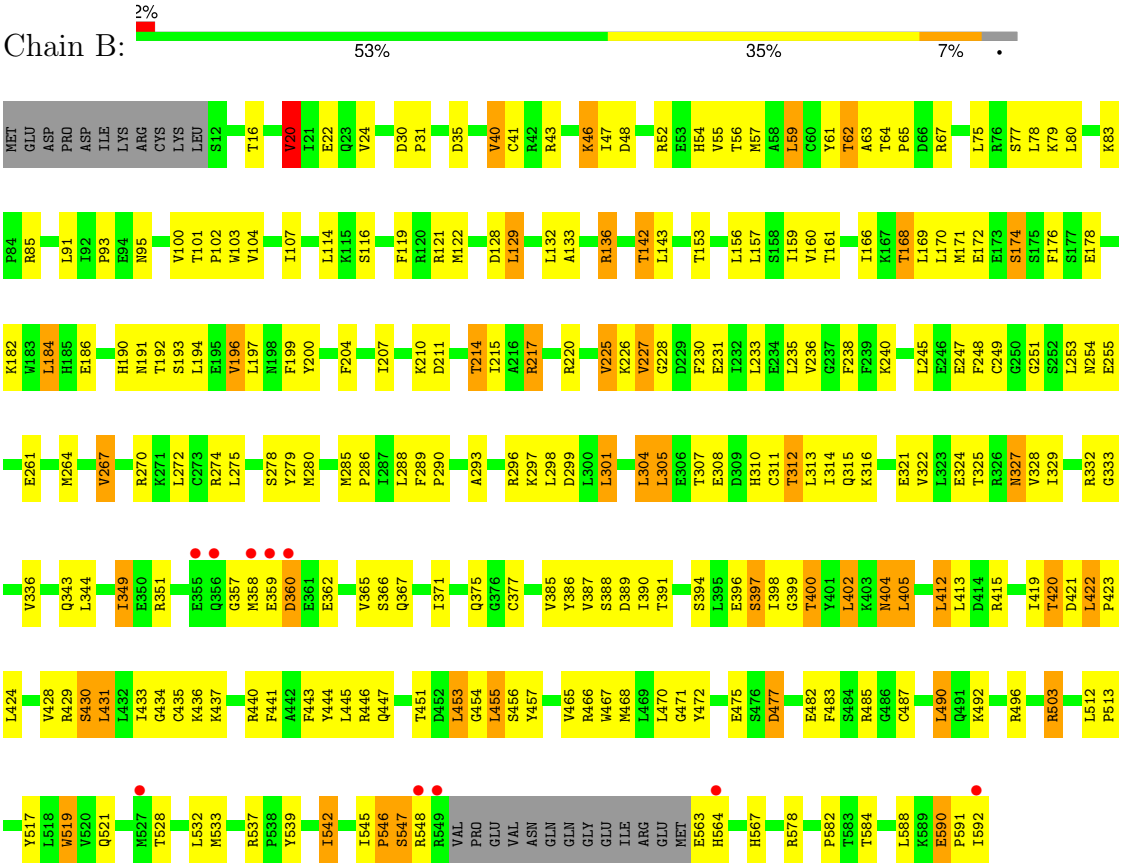
• Molecule 1: SKP1-like protein 1A

Chain O:



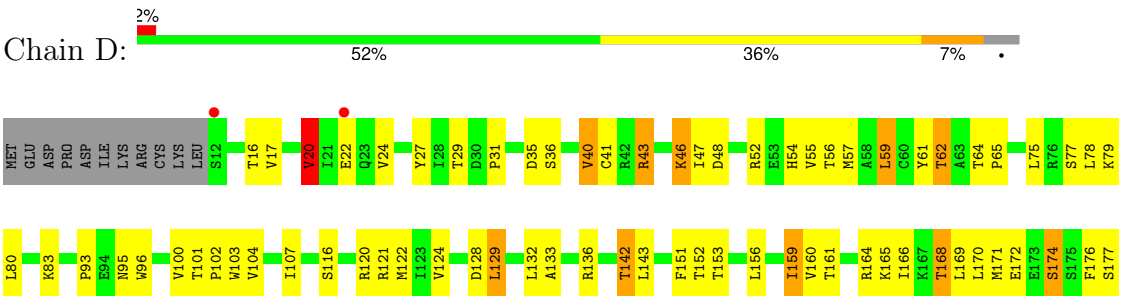
• Molecule 2: Coronatine-insensitive protein 1

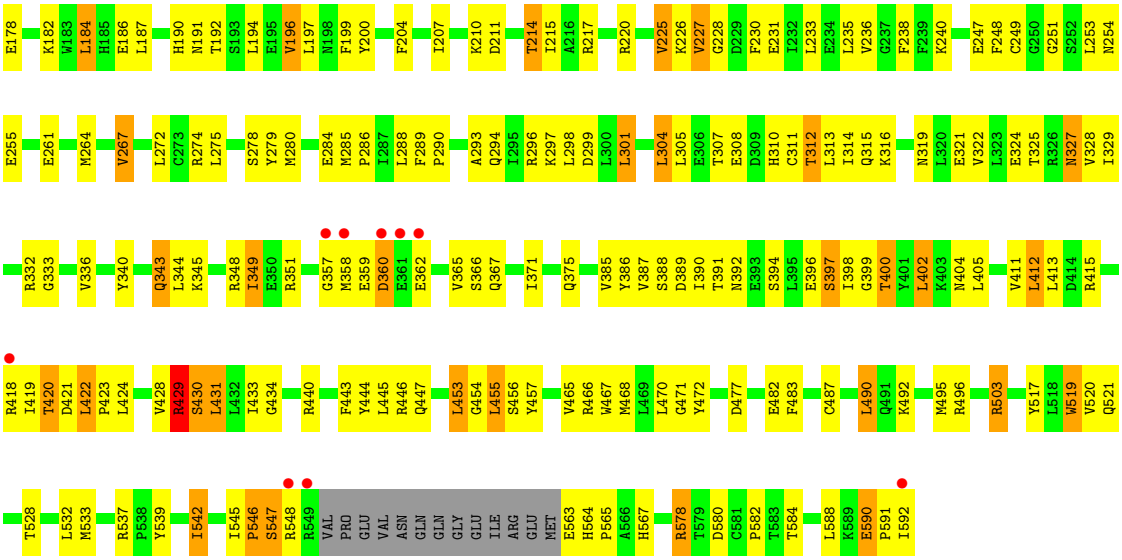
Chain B:



• Molecule 2: Coronatine-insensitive protein 1

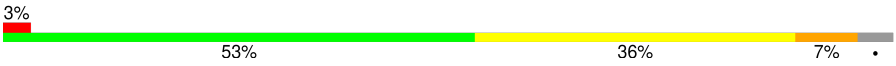
Chain D:

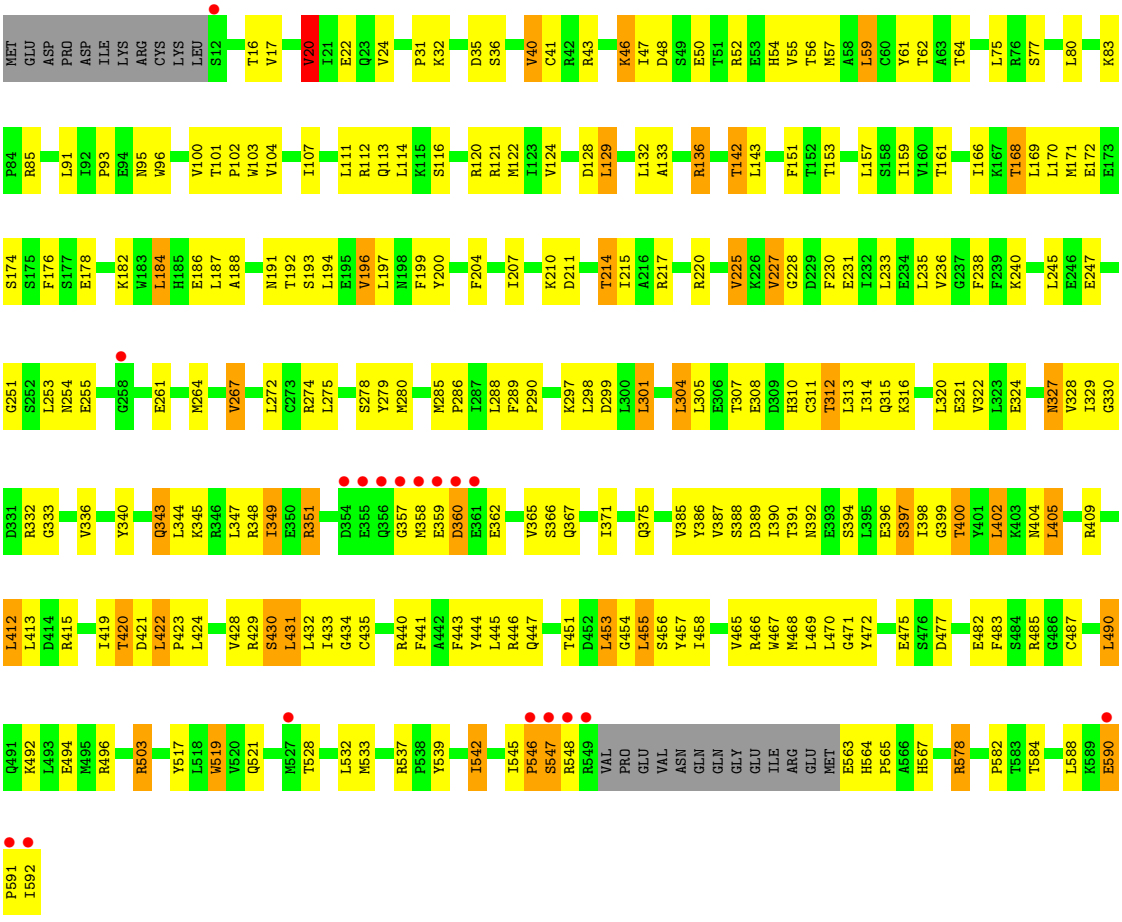




• Molecule 2: Coronatine-insensitive protein 1

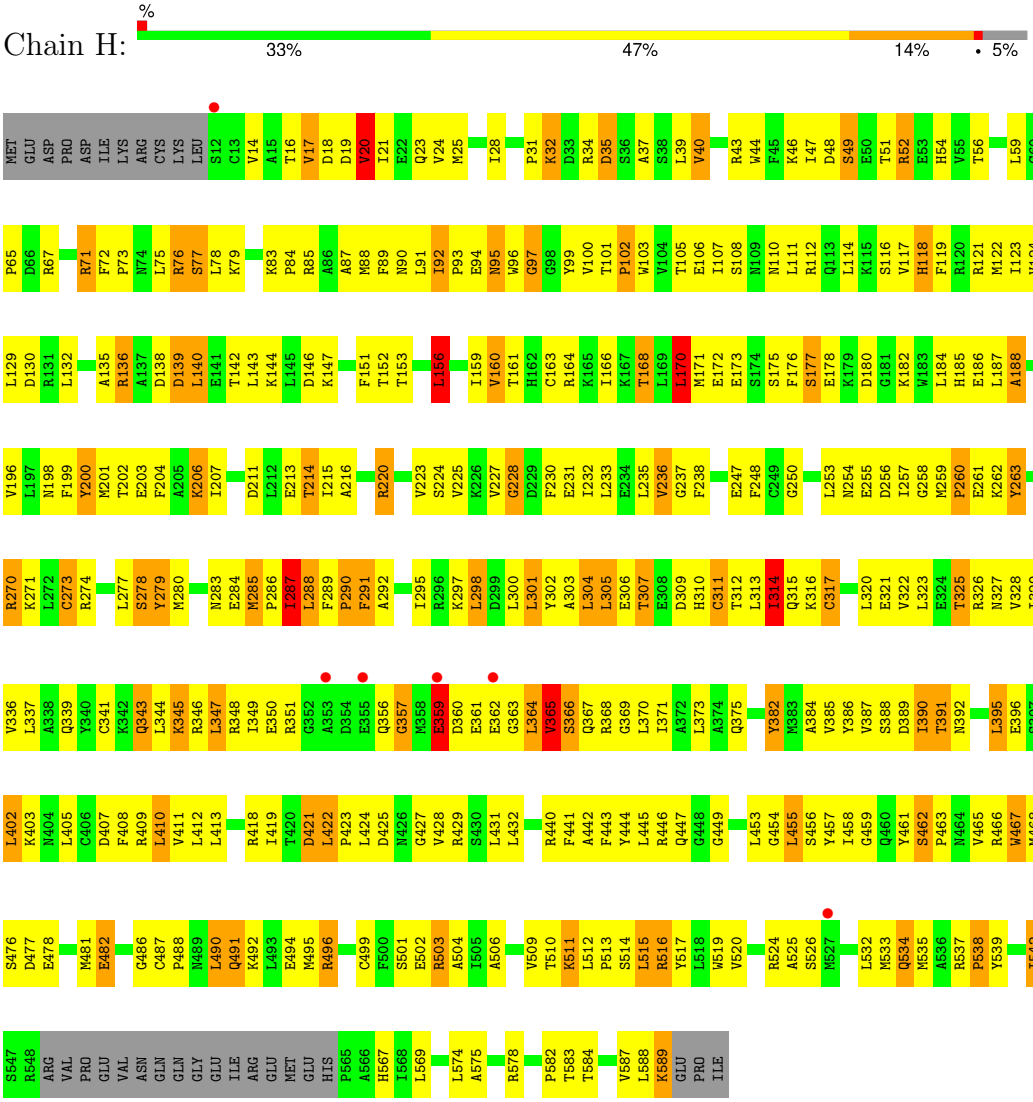
Chain F:





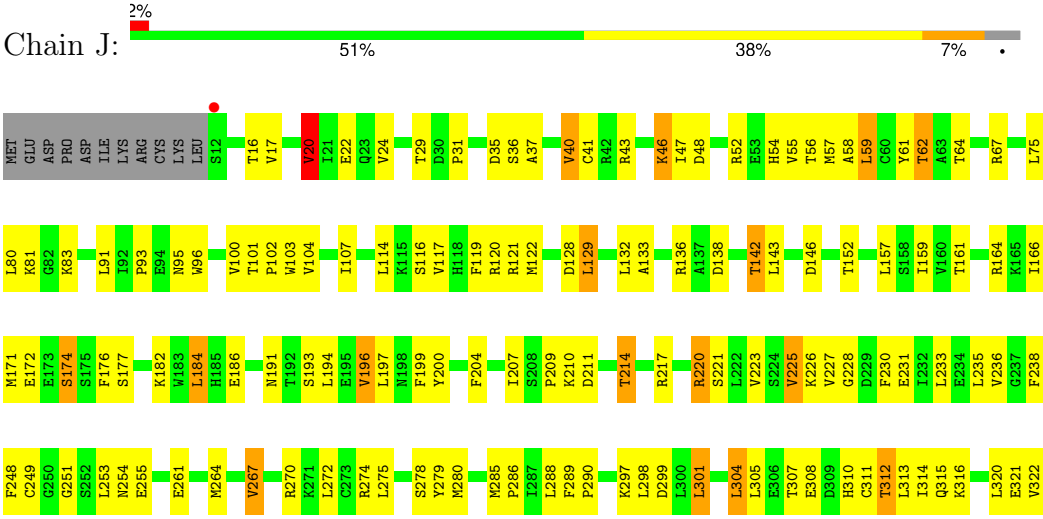
• Molecule 2: Coronatine-insensitive protein 1

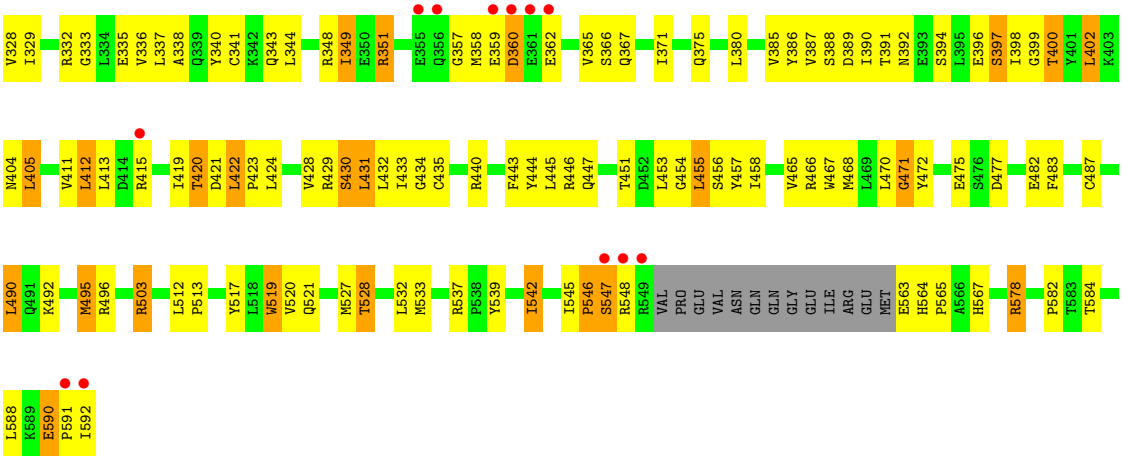
Chain H:



• Molecule 2: Coronatine-insensitive protein 1

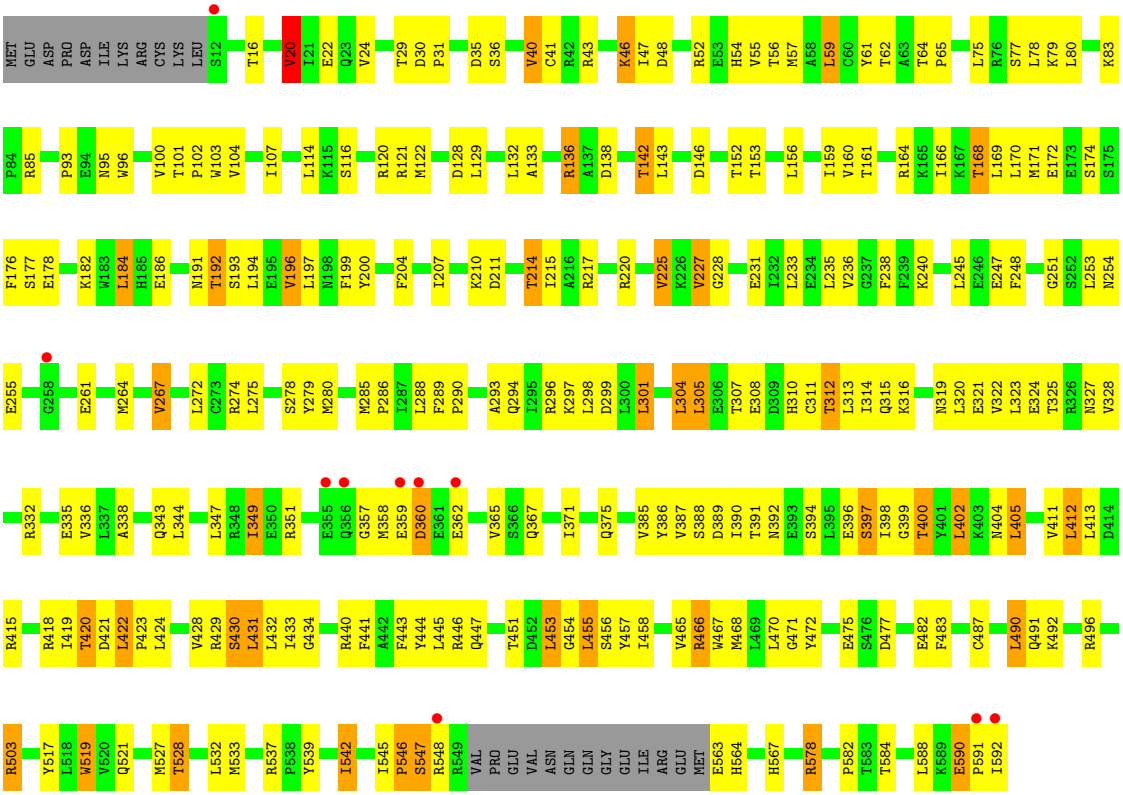
Chain J:





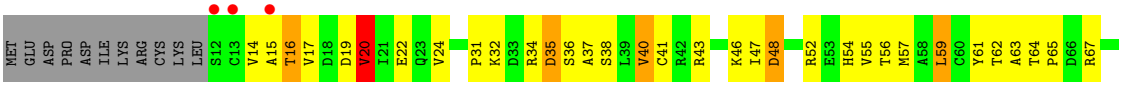
• Molecule 2: Coronatine-insensitive protein 1

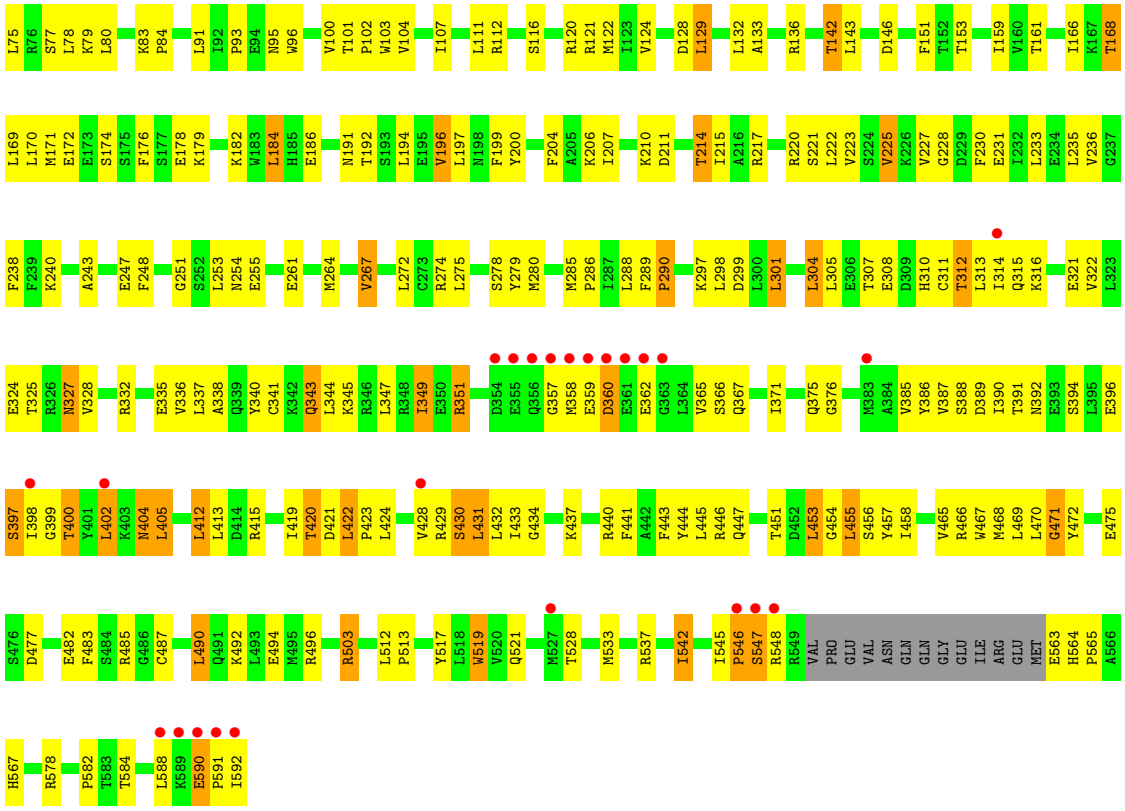
Chain L:



• Molecule 2: Coronatine-insensitive protein 1

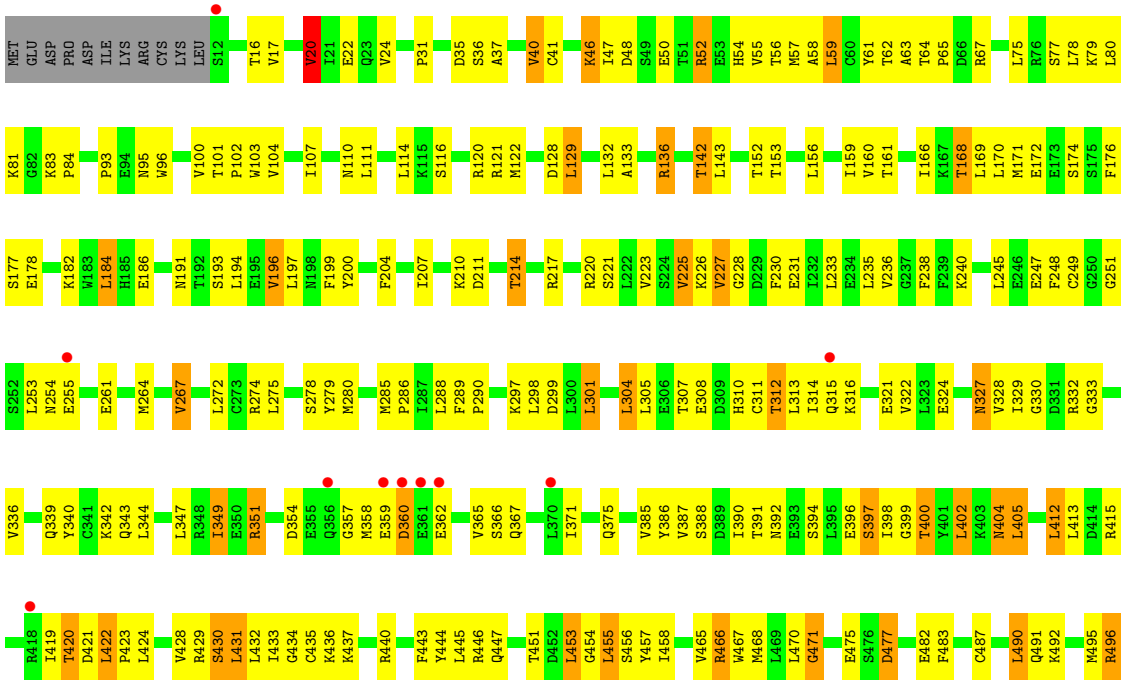
Chain N:

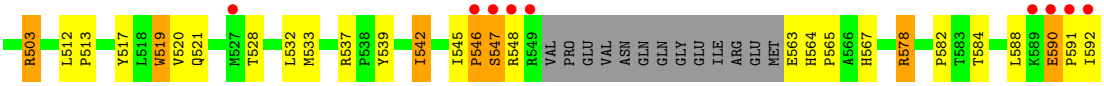




• Molecule 2: Coronatine-insensitive protein 1

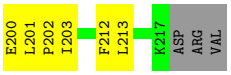
Chain P:





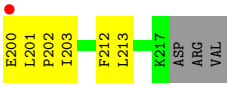
• Molecule 3: JAZ1 incomplete degron peptide

Chain Q:



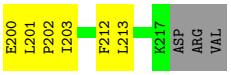
• Molecule 3: JAZ1 incomplete degron peptide

Chain R:



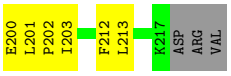
• Molecule 3: JAZ1 incomplete degron peptide

Chain S:



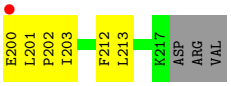
• Molecule 3: JAZ1 incomplete degron peptide

Chain U:



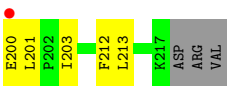
• Molecule 3: JAZ1 incomplete degron peptide

Chain V:



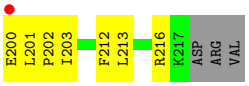
• Molecule 3: JAZ1 incomplete degron peptide

Chain W:



• Molecule 3: JAZ1 incomplete degron peptide

Chain X:


E200
L201
P202
I203
F212
L213
R216
K217
ASP
ARG
VAL

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	122.35Å 220.82Å 148.67Å 90.00° 104.52° 90.00°	Depositor
Resolution (Å)	49.68 – 3.18 49.68 – 3.18	Depositor EDS
% Data completeness (in resolution range)	91.1 (49.68-3.18) 91.1 (49.68-3.18)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.38 (at 3.19Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, R_{free}	0.215 , 0.263 0.204 , 0.248	Depositor DCC
R_{free} test set	2000 reflections (1.62%)	wwPDB-VP
Wilson B-factor (Å^2)	61.4	Xtriage
Anisotropy	0.248	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 41.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	46877	wwPDB-VP
Average B, all atoms (Å^2)	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.47% 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: PO4, 7JA

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	0.48	0/1162	0.60	0/1571
1	C	0.56	0/1162	0.63	0/1571
1	E	0.53	0/1162	0.63	0/1571
1	G	0.55	0/1162	0.69	0/1571
1	I	0.49	0/1162	0.61	0/1571
1	K	0.48	0/1162	0.61	0/1571
1	M	0.52	0/1162	0.61	0/1571
1	O	0.51	0/1162	0.60	0/1571
2	B	0.60	1/4623 (0.0%)	0.71	1/6238 (0.0%)
2	D	0.58	0/4623	0.71	2/6238 (0.0%)
2	F	0.53	0/4623	0.71	1/6238 (0.0%)
2	H	0.63	0/4566	0.87	3/6161 (0.0%)
2	J	0.54	0/4623	0.70	1/6238 (0.0%)
2	L	0.52	0/4623	0.70	1/6238 (0.0%)
2	N	0.61	0/4623	0.72	1/6238 (0.0%)
2	P	0.54	0/4623	0.70	1/6238 (0.0%)
3	Q	0.50	0/158	0.58	0/208
3	R	0.44	0/158	0.60	0/208
3	S	0.41	0/158	0.57	0/208
3	U	0.47	0/158	0.56	0/208
3	V	0.44	0/158	0.57	0/208
3	W	0.48	0/158	0.60	0/208
3	X	0.47	0/158	0.55	0/208
All	All	0.56	1/47329 (0.0%)	0.71	11/63851 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	377	CYS	CB-SG	-5.33	1.73	1.81

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	F	129	LEU	CA-CB-CG	7.85	133.35	115.30
2	D	129	LEU	CA-CB-CG	7.68	132.96	115.30
2	N	129	LEU	CA-CB-CG	7.36	132.23	115.30
2	B	129	LEU	CA-CB-CG	7.23	131.94	115.30
2	P	129	LEU	CA-CB-CG	7.20	131.85	115.30

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	1146	0	1117	58	0
1	C	1146	0	1117	65	0
1	E	1146	0	1117	59	0
1	G	1146	0	1117	57	0
1	I	1146	0	1117	61	2
1	K	1146	0	1117	58	0
1	M	1146	0	1117	95	0
1	O	1146	0	1117	56	0
2	B	4541	0	4583	222	0
2	D	4541	0	4583	235	2
2	F	4541	0	4583	233	0
2	H	4486	0	4534	428	0
2	J	4541	0	4583	237	0
2	L	4541	0	4583	245	0
2	N	4541	0	4583	271	0
2	P	4541	0	4583	235	0
3	Q	156	0	171	5	0
3	R	156	0	171	5	0
3	S	156	0	171	5	0
3	U	156	0	171	5	0
3	V	156	0	171	5	0
3	W	156	0	171	4	0
3	X	156	0	171	5	0
4	B	23	0	29	16	0
4	D	23	0	28	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	F	23	0	28	19	0
4	H	23	0	29	21	0
4	J	23	0	28	17	0
4	L	23	0	28	16	0
4	N	23	0	28	17	0
4	P	23	0	28	15	0
5	B	20	0	0	2	0
5	D	20	0	0	3	0
5	F	20	0	0	4	0
5	H	20	0	0	3	0
5	J	20	0	0	2	0
5	L	20	0	0	3	0
5	N	20	0	0	2	0
5	P	20	0	0	3	0
All	All	46877	0	46974	2545	2

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 27.

The worst 5 of 2545 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:168:THR:HB	2:B:196:VAL:HG13	1.28	1.14
2:L:168:THR:HB	2:L:196:VAL:HG13	1.22	1.14
2:F:168:THR:HB	2:F:196:VAL:HG13	1.27	1.13
4:J:1100:7JA:H12	4:J:1100:7JA:H04	1.29	1.13
1:G:151:VAL:HG11	2:H:39:LEU:HD21	1.28	1.13

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:429:ARG:NH2	1:I:61:ARG:NH1[2_555]	2.06	0.14
2:D:429:ARG:NH1	1:I:86:TRP:CE3[2_555]	2.14	0.06

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	140/160 (88%)	115 (82%)	22 (16%)	3 (2%)	7	34
1	C	140/160 (88%)	113 (81%)	23 (16%)	4 (3%)	4	26
1	E	140/160 (88%)	114 (81%)	23 (16%)	3 (2%)	7	34
1	G	140/160 (88%)	114 (81%)	22 (16%)	4 (3%)	4	26
1	I	140/160 (88%)	117 (84%)	20 (14%)	3 (2%)	7	34
1	K	140/160 (88%)	117 (84%)	19 (14%)	4 (3%)	4	26
1	M	140/160 (88%)	110 (79%)	27 (19%)	3 (2%)	7	34
1	O	140/160 (88%)	112 (80%)	25 (18%)	3 (2%)	7	34
2	B	564/592 (95%)	500 (89%)	57 (10%)	7 (1%)	13	48
2	D	564/592 (95%)	504 (89%)	53 (9%)	7 (1%)	13	48
2	F	564/592 (95%)	505 (90%)	52 (9%)	7 (1%)	13	48
2	H	558/592 (94%)	430 (77%)	98 (18%)	30 (5%)	2	13
2	J	564/592 (95%)	504 (89%)	52 (9%)	8 (1%)	11	44
2	L	564/592 (95%)	503 (89%)	54 (10%)	7 (1%)	13	48
2	N	564/592 (95%)	504 (89%)	51 (9%)	9 (2%)	9	41
2	P	564/592 (95%)	500 (89%)	56 (10%)	8 (1%)	11	44
3	Q	16/21 (76%)	16 (100%)	0	0	100	100
3	R	16/21 (76%)	16 (100%)	0	0	100	100
3	S	16/21 (76%)	15 (94%)	1 (6%)	0	100	100
3	U	16/21 (76%)	15 (94%)	1 (6%)	0	100	100
3	V	16/21 (76%)	15 (94%)	1 (6%)	0	100	100
3	W	16/21 (76%)	15 (94%)	1 (6%)	0	100	100
3	X	16/21 (76%)	15 (94%)	1 (6%)	0	100	100
All	All	5738/6163 (93%)	4969 (87%)	659 (12%)	110 (2%)	8	37

5 of 110 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	36	ASP
2	B	420	THR
2	B	546	PRO
1	C	36	ASP
2	D	420	THR

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	127/137 (93%)	113 (89%)	14 (11%)	6 24
1	C	127/137 (93%)	113 (89%)	14 (11%)	6 24
1	E	127/137 (93%)	113 (89%)	14 (11%)	6 24
1	G	127/137 (93%)	115 (91%)	12 (9%)	8 31
1	I	127/137 (93%)	113 (89%)	14 (11%)	6 24
1	K	127/137 (93%)	116 (91%)	11 (9%)	10 35
1	M	127/137 (93%)	112 (88%)	15 (12%)	5 22
1	O	127/137 (93%)	115 (91%)	12 (9%)	8 31
2	B	500/523 (96%)	436 (87%)	64 (13%)	4 18
2	D	500/523 (96%)	431 (86%)	69 (14%)	3 16
2	F	500/523 (96%)	435 (87%)	65 (13%)	4 18
2	H	494/523 (94%)	395 (80%)	99 (20%)	1 6
2	J	500/523 (96%)	436 (87%)	64 (13%)	4 18
2	L	500/523 (96%)	439 (88%)	61 (12%)	5 20
2	N	500/523 (96%)	437 (87%)	63 (13%)	4 19
2	P	500/523 (96%)	436 (87%)	64 (13%)	4 18
3	Q	16/19 (84%)	15 (94%)	1 (6%)	18 50
3	R	16/19 (84%)	15 (94%)	1 (6%)	18 50
3	S	16/19 (84%)	15 (94%)	1 (6%)	18 50

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	U	16/19 (84%)	15 (94%)	1 (6%)	18 50
3	V	16/19 (84%)	15 (94%)	1 (6%)	18 50
3	W	16/19 (84%)	15 (94%)	1 (6%)	18 50
3	X	16/19 (84%)	15 (94%)	1 (6%)	18 50
All	All	5122/5413 (95%)	4460 (87%)	662 (13%)	4 18

5 of 662 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	L	193	SER
2	N	455	LEU
2	L	327	ASN
2	L	192	THR
1	M	160	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 113 such sidechains are listed below:

Mol	Chain	Res	Type
2	H	375	GLN
2	P	343	GLN
2	J	327	ASN
2	P	327	ASN
2	N	460	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

40 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	$\#\|Z\| > 2$
4	7JA	P	1100	-	23,23,23	2.03	5 (21%)	25,30,30	2.06	6 (24%)
5	PO4	H	1104	-	4,4,4	4.41	4 (100%)	6,6,6	1.91	1 (16%)
5	PO4	P	1104	-	4,4,4	4.40	4 (100%)	6,6,6	1.05	0
4	7JA	L	1100	-	23,23,23	2.04	5 (21%)	25,30,30	1.88	5 (20%)
5	PO4	J	1102	-	4,4,4	4.55	4 (100%)	6,6,6	0.43	0
4	7JA	H	1100	-	23,23,23	1.62	5 (21%)	25,30,30	2.02	8 (32%)
5	PO4	B	1103	-	4,4,4	4.12	4 (100%)	6,6,6	0.74	0
4	7JA	J	1100	-	23,23,23	2.11	6 (26%)	25,30,30	2.08	6 (24%)
5	PO4	J	1103	-	4,4,4	4.37	4 (100%)	6,6,6	0.78	0
5	PO4	N	1102	-	4,4,4	4.55	4 (100%)	6,6,6	0.75	0
5	PO4	N	1103	-	4,4,4	4.31	4 (100%)	6,6,6	1.16	0
5	PO4	H	1101	-	4,4,4	4.54	4 (100%)	6,6,6	1.05	1 (16%)
5	PO4	D	1101	-	4,4,4	4.22	4 (100%)	6,6,6	0.89	0
5	PO4	J	1101	-	4,4,4	4.27	4 (100%)	6,6,6	0.95	0
5	PO4	F	1101	-	4,4,4	4.38	4 (100%)	6,6,6	1.69	2 (33%)
4	7JA	D	1100	-	23,23,23	2.11	5 (21%)	25,30,30	2.02	5 (20%)
5	PO4	D	1104	-	4,4,4	4.33	3 (75%)	6,6,6	1.13	0
5	PO4	L	1104	-	4,4,4	4.33	4 (100%)	6,6,6	0.81	0
5	PO4	P	1101	-	4,4,4	4.44	4 (100%)	6,6,6	0.72	0
4	7JA	F	1100	-	23,23,23	2.10	5 (21%)	25,30,30	2.12	5 (20%)
5	PO4	F	1104	-	4,4,4	4.31	4 (100%)	6,6,6	1.32	0
5	PO4	P	1102	-	4,4,4	4.47	4 (100%)	6,6,6	0.49	0
5	PO4	L	1101	-	4,4,4	4.18	4 (100%)	6,6,6	0.81	0
5	PO4	B	1101	-	4,4,4	4.42	4 (100%)	6,6,6	0.70	0
5	PO4	L	1102	-	4,4,4	4.45	4 (100%)	6,6,6	0.32	0
5	PO4	H	1103	-	4,4,4	4.37	4 (100%)	6,6,6	0.68	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
5	PO4	P	1103	-	4,4,4	4.44	4 (100%)	6,6,6	0.96	0
5	PO4	F	1102	-	4,4,4	4.58	4 (100%)	6,6,6	0.38	0
5	PO4	N	1101	-	4,4,4	4.27	4 (100%)	6,6,6	1.17	0
5	PO4	J	1104	-	4,4,4	4.34	4 (100%)	6,6,6	0.80	0
5	PO4	B	1102	-	4,4,4	4.33	4 (100%)	6,6,6	0.69	0
5	PO4	B	1104	-	4,4,4	4.43	4 (100%)	6,6,6	1.03	0
5	PO4	N	1104	-	4,4,4	4.53	4 (100%)	6,6,6	1.00	0
4	7JA	B	1100	-	23,23,23	1.66	4 (17%)	25,30,30	2.11	6 (24%)
5	PO4	H	1102	-	4,4,4	4.55	4 (100%)	6,6,6	0.65	0
5	PO4	D	1102	-	4,4,4	4.32	4 (100%)	6,6,6	0.28	0
5	PO4	D	1103	-	4,4,4	4.23	4 (100%)	6,6,6	0.91	0
4	7JA	N	1100	-	23,23,23	2.18	6 (26%)	25,30,30	2.04	6 (24%)
5	PO4	F	1103	-	4,4,4	4.20	4 (100%)	6,6,6	0.73	0
5	PO4	L	1103	-	4,4,4	4.44	4 (100%)	6,6,6	0.64	0

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
4	7JA	F	1100	-	-	7/23/36/36	0/1/1/1
4	7JA	P	1100	-	-	7/23/36/36	0/1/1/1
4	7JA	B	1100	-	-	6/23/36/36	0/1/1/1
4	7JA	L	1100	-	-	7/23/36/36	0/1/1/1
4	7JA	H	1100	-	-	12/23/36/36	0/1/1/1
4	7JA	N	1100	-	-	7/23/36/36	0/1/1/1
4	7JA	D	1100	-	-	8/23/36/36	0/1/1/1
4	7JA	J	1100	-	-	5/23/36/36	0/1/1/1

The worst 5 of 168 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	1102	PO4	P-O1	7.07	1.67	1.50
5	P	1103	PO4	P-O1	7.00	1.66	1.50
5	J	1104	PO4	P-O1	6.97	1.66	1.50
4	N	1100	7JA	O-C	6.96	1.42	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	P	1104	PO4	P-O1	6.92	1.66	1.50

The worst 5 of 51 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	N	1100	7JA	CB-CA-N	-6.37	98.25	111.35
4	J	1100	7JA	CB-CA-N	-5.79	99.44	111.35
4	D	1100	7JA	CB-CA-N	-5.78	99.46	111.35
4	B	1100	7JA	CB-CA-N	-5.76	99.51	111.35
4	F	1100	7JA	CB-CA-N	-5.59	99.86	111.35

There are no chirality outliers.

5 of 59 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	1100	7JA	C11-C12-C13-N
4	B	1100	7JA	C11-C12-C13-O14
4	D	1100	7JA	C11-C12-C13-N
4	D	1100	7JA	C11-C12-C13-O14
4	F	1100	7JA	C11-C12-C13-N

There are no ring outliers.

18 monomers are involved in 158 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	P	1100	7JA	15	0
4	L	1100	7JA	16	0
4	H	1100	7JA	21	0
5	B	1103	PO4	2	0
4	J	1100	7JA	17	0
5	J	1103	PO4	2	0
5	N	1103	PO4	2	0
5	F	1101	PO4	1	0
4	D	1100	7JA	15	0
4	F	1100	7JA	19	0
5	L	1101	PO4	1	0
5	H	1103	PO4	3	0
5	P	1103	PO4	3	0
4	B	1100	7JA	16	0
5	D	1103	PO4	3	0
4	N	1100	7JA	17	0

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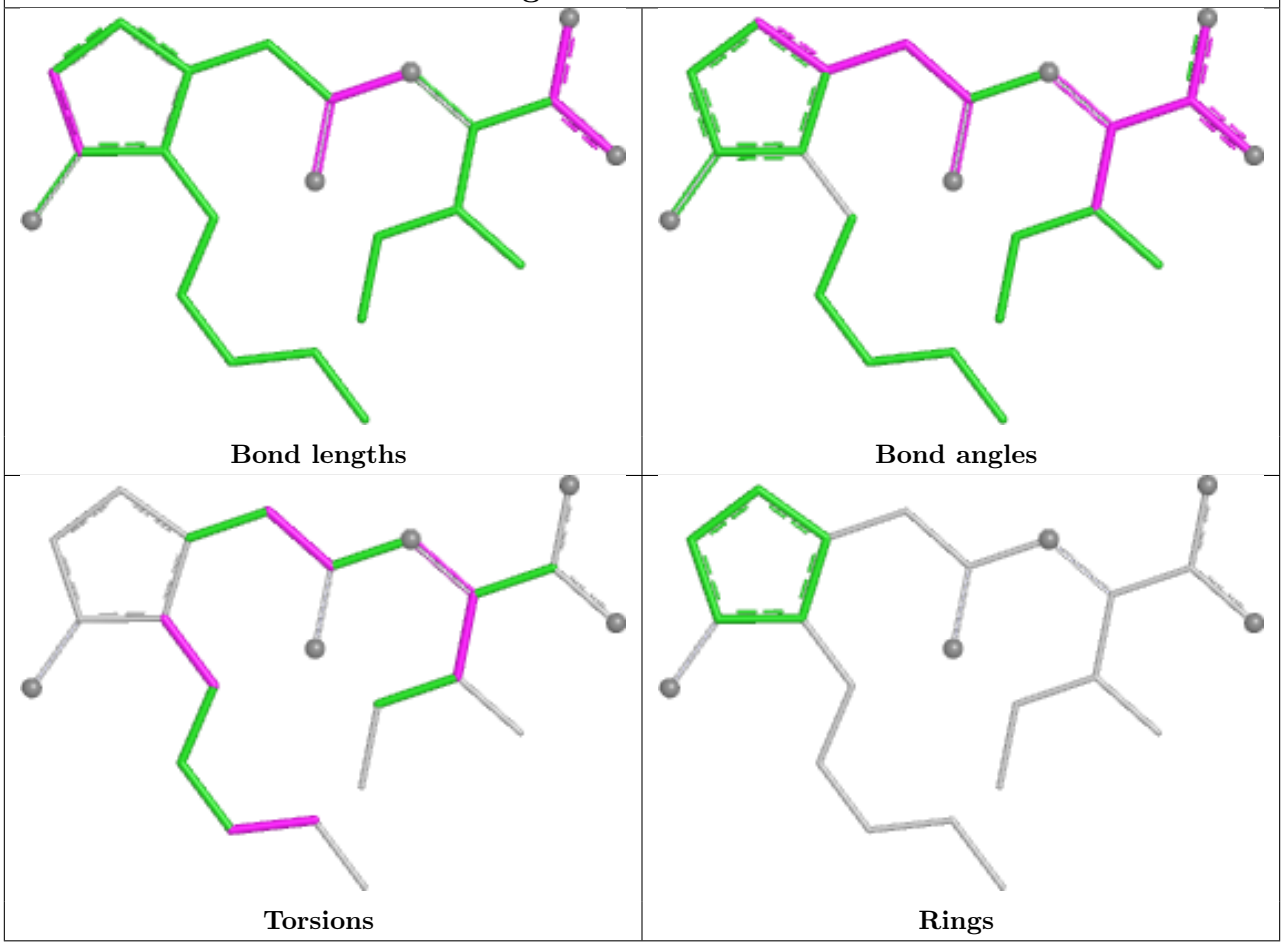
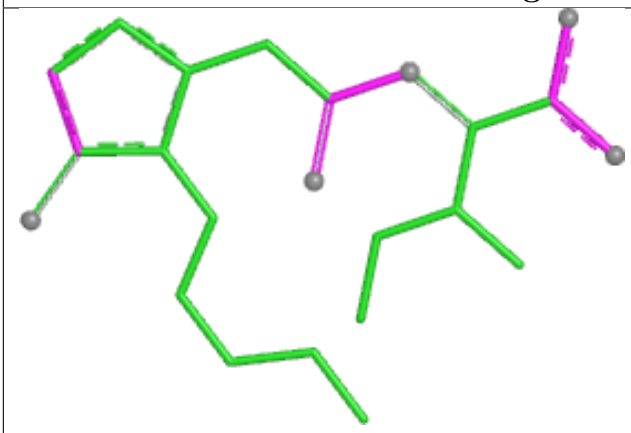
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	F	1103	PO4	3	0
5	L	1103	PO4	2	0

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

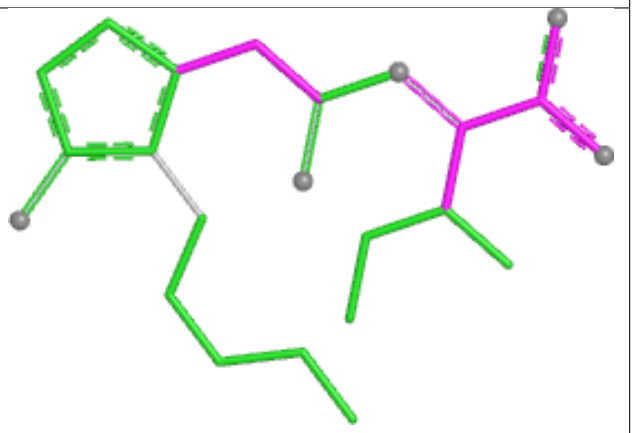
Ligand 7JA P 1100



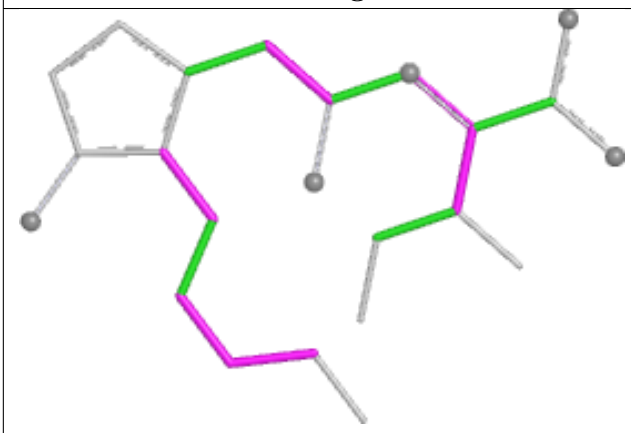
Ligand 7JA L 1100



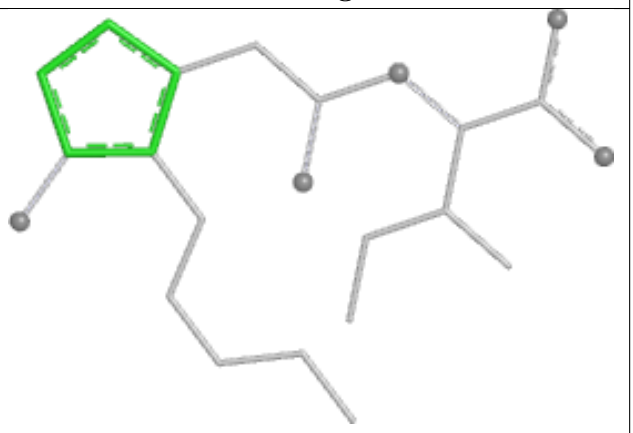
Bond lengths



Bond angles

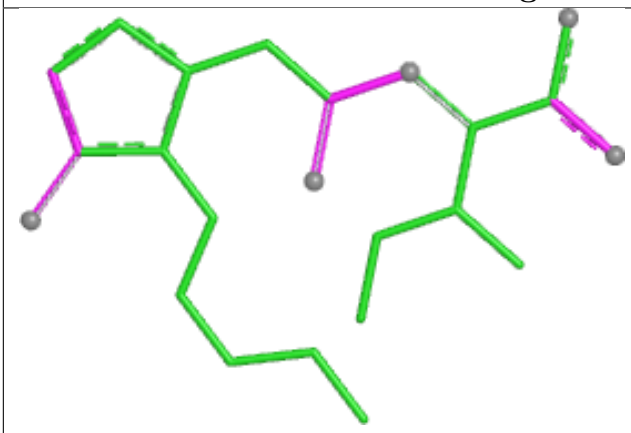


Torsions

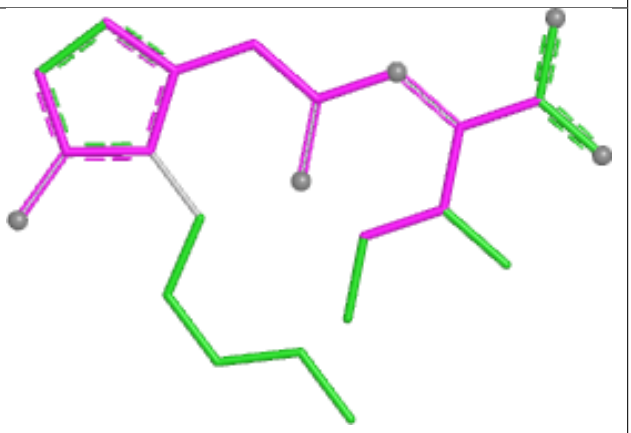


Rings

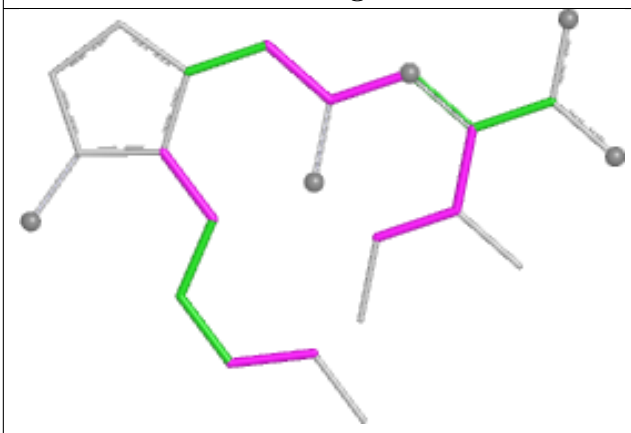
Ligand 7JA H 1100



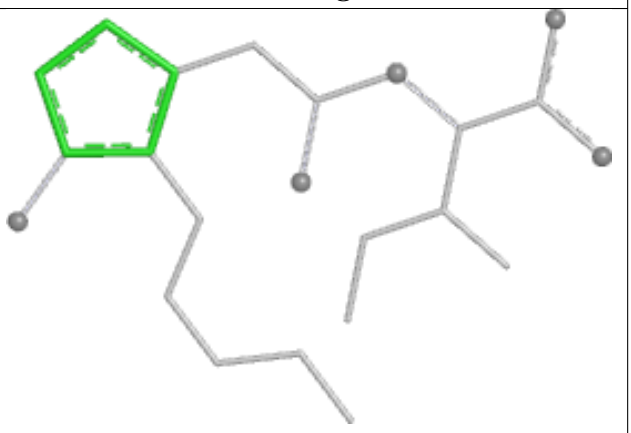
Bond lengths



Bond angles

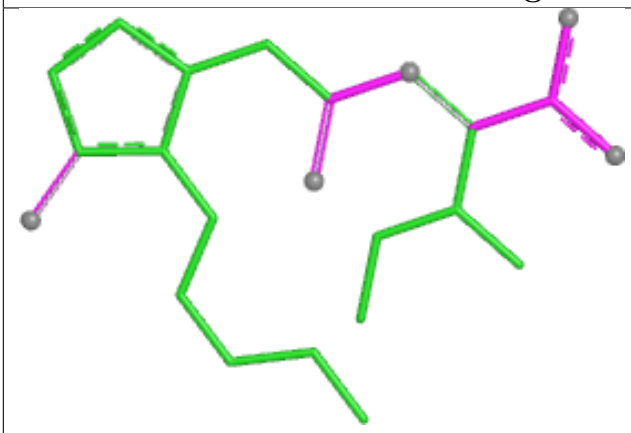


Torsions

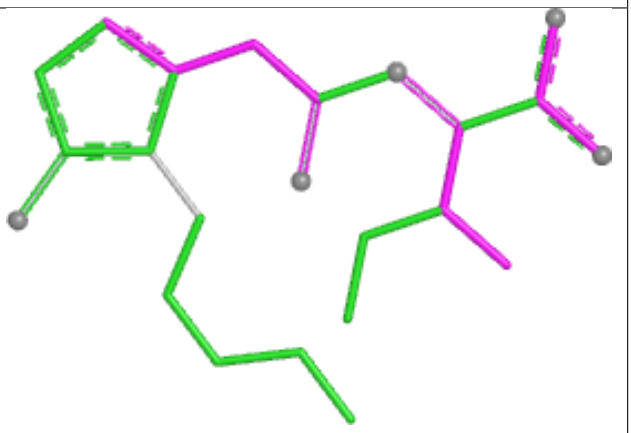


Rings

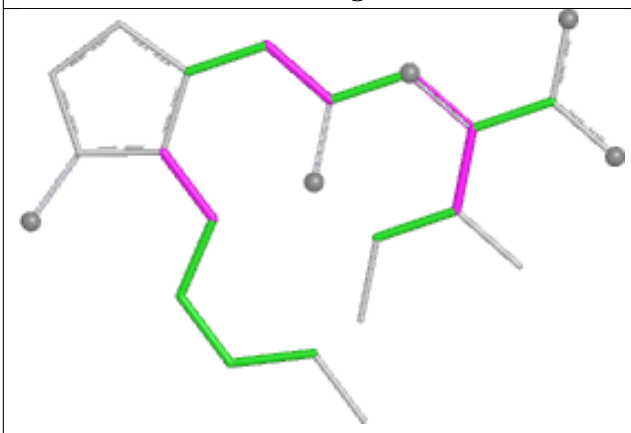
Ligand 7JA J 1100



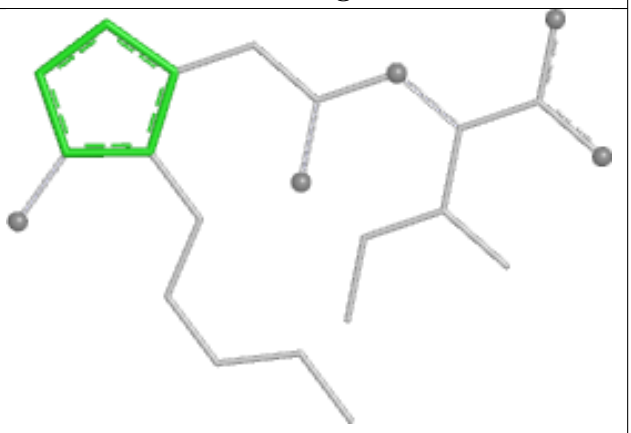
Bond lengths



Bond angles

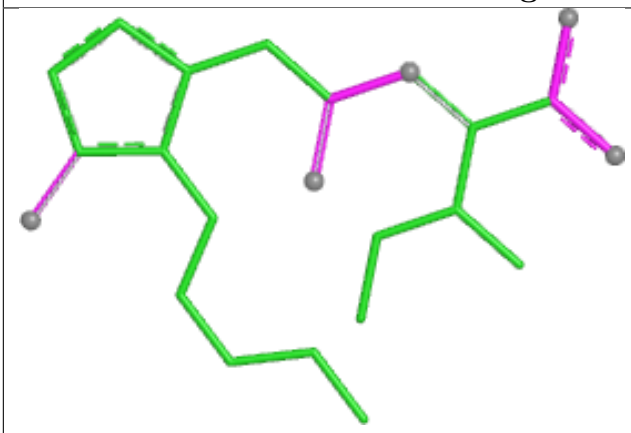


Torsions

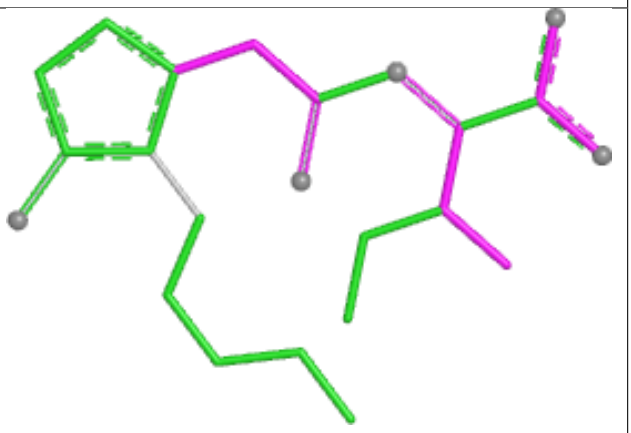


Rings

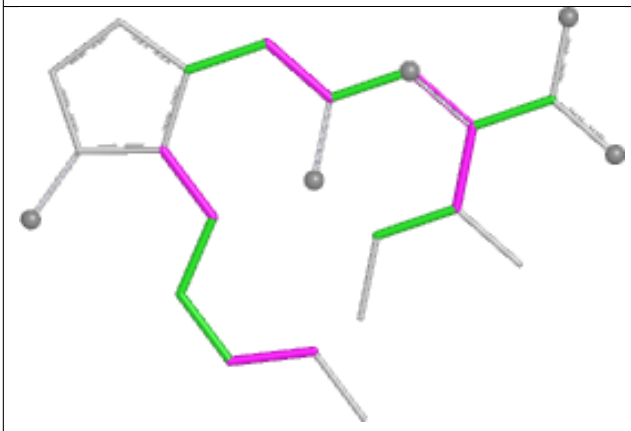
Ligand 7JA D 1100



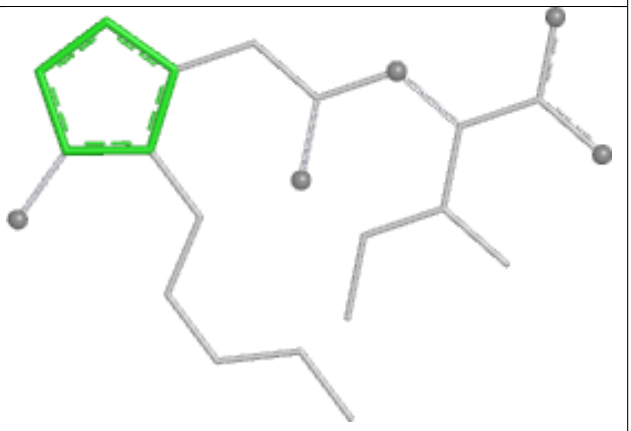
Bond lengths



Bond angles

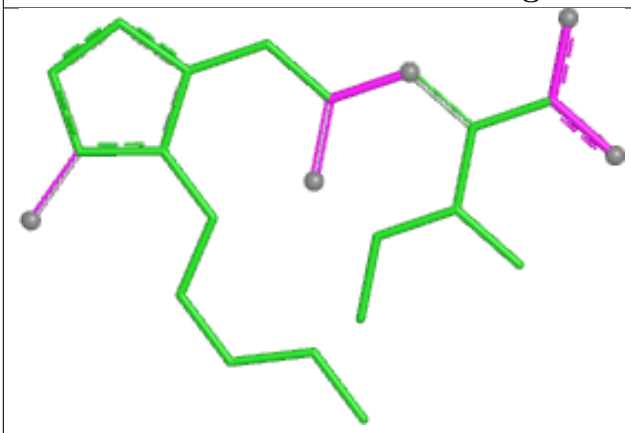


Torsions

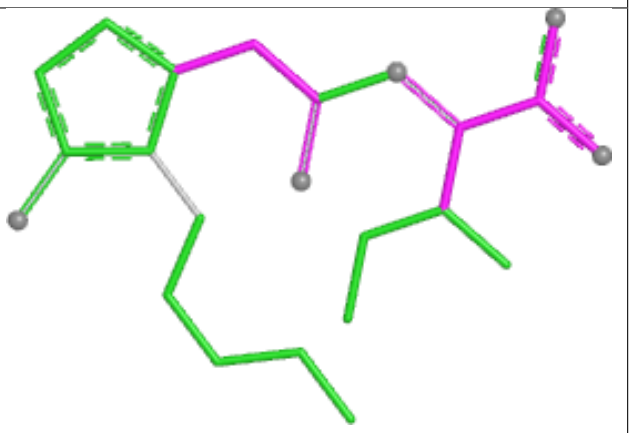


Rings

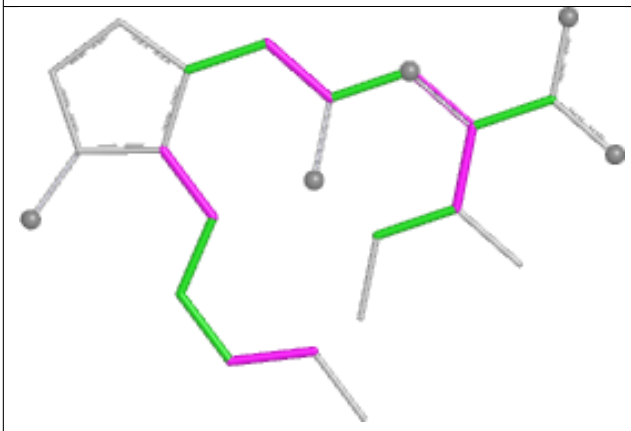
Ligand 7JA F 1100



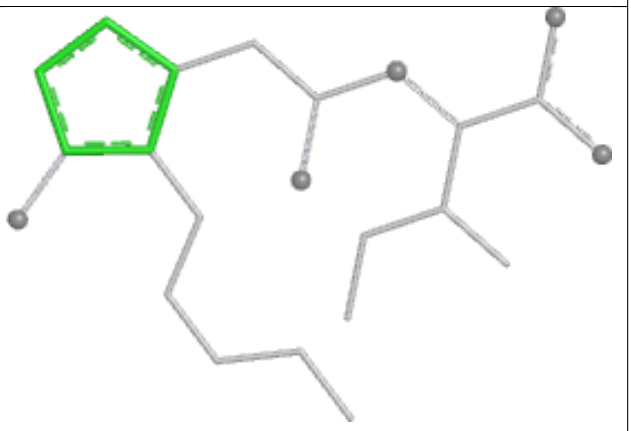
Bond lengths



Bond angles

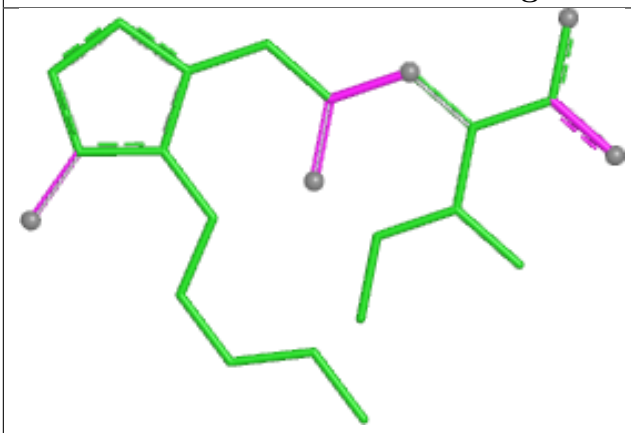


Torsions

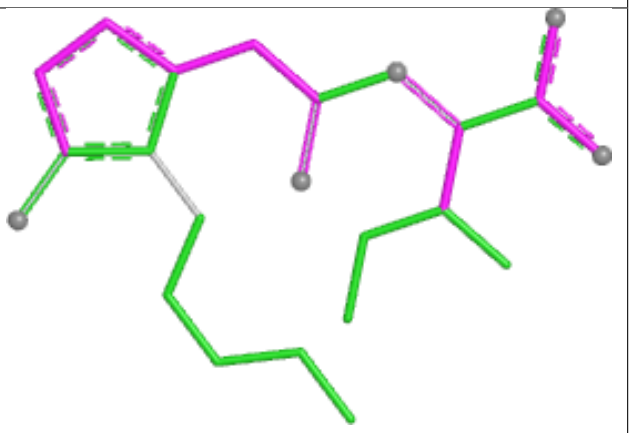


Rings

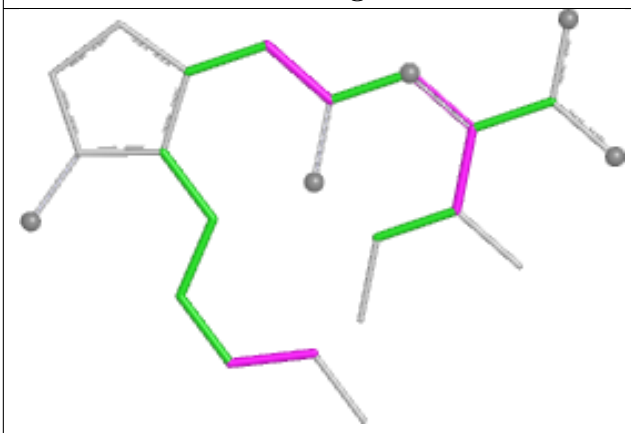
Ligand 7JA B 1100



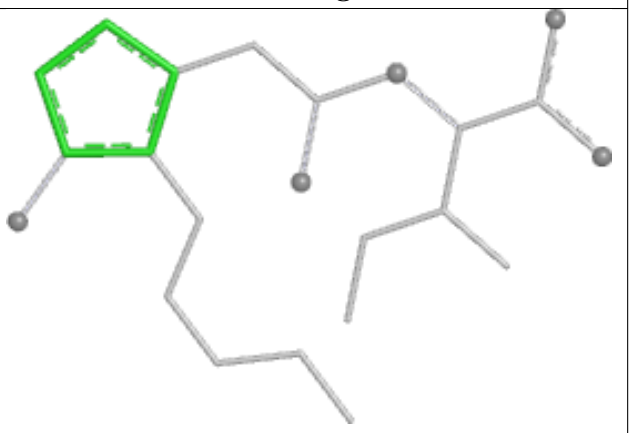
Bond lengths



Bond angles

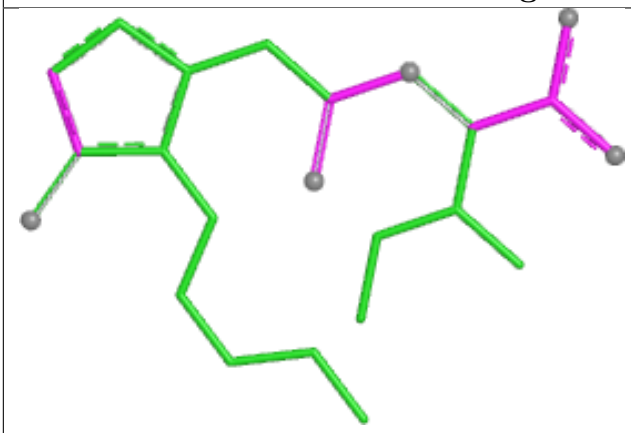


Torsions

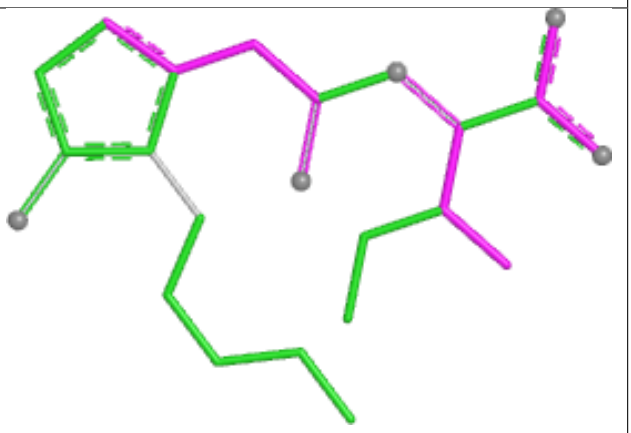


Rings

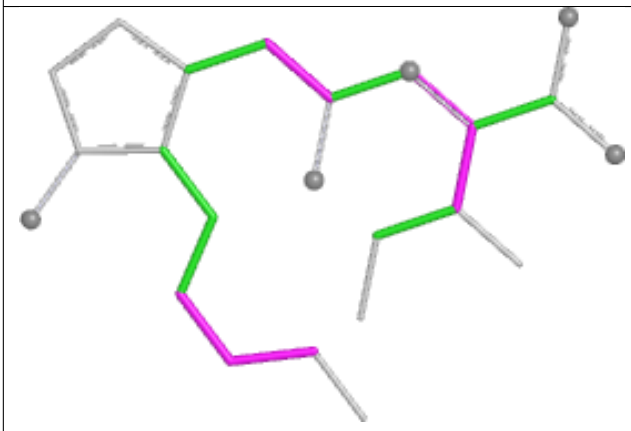
Ligand 7JA N 1100



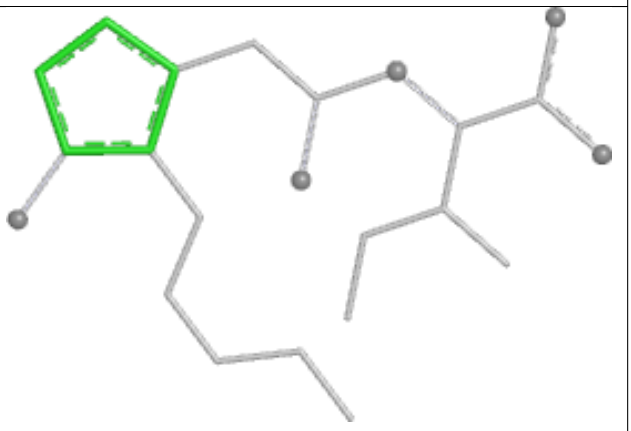
Bond lengths



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	144/160 (90%)	0.27	4 (2%) 53 37	38, 87, 141, 157	0
1	C	144/160 (90%)	0.53	8 (5%) 24 13	40, 90, 140, 159	0
1	E	144/160 (90%)	0.04	0 100 100	41, 85, 136, 157	0
1	G	144/160 (90%)	-0.09	0 100 100	37, 81, 136, 156	0
1	I	144/160 (90%)	0.34	8 (5%) 24 13	43, 88, 138, 160	0
1	K	144/160 (90%)	0.44	10 (6%) 16 9	43, 89, 140, 158	0
1	M	144/160 (90%)	0.60	18 (12%) 3 2	45, 89, 139, 163	0
1	O	144/160 (90%)	0.61	16 (11%) 5 3	43, 88, 138, 159	0
2	B	568/592 (95%)	-0.22	10 (1%) 68 55	31, 60, 122, 191	0
2	D	568/592 (95%)	-0.19	11 (1%) 66 53	33, 61, 124, 190	0
2	F	568/592 (95%)	-0.24	18 (3%) 47 31	32, 63, 125, 191	0
2	H	562/592 (94%)	-0.47	6 (1%) 80 69	29, 57, 106, 169	0
2	J	568/592 (95%)	-0.31	13 (2%) 60 46	33, 64, 124, 194	0
2	L	568/592 (95%)	-0.30	10 (1%) 68 55	33, 64, 125, 192	0
2	N	568/592 (95%)	0.08	27 (4%) 30 17	33, 69, 126, 194	0
2	P	568/592 (95%)	-0.18	19 (3%) 46 30	34, 68, 126, 192	0
3	Q	18/21 (85%)	-0.13	0 100 100	61, 77, 108, 128	0
3	R	18/21 (85%)	-0.11	1 (5%) 24 13	63, 78, 108, 131	0
3	S	18/21 (85%)	-0.28	0 100 100	64, 78, 109, 129	0
3	U	18/21 (85%)	-0.32	0 100 100	60, 80, 109, 130	0
3	V	18/21 (85%)	-0.18	1 (5%) 24 13	61, 81, 108, 132	0
3	W	18/21 (85%)	0.11	1 (5%) 24 13	66, 83, 110, 132	0
3	X	18/21 (85%)	-0.22	1 (5%) 24 13	65, 81, 109, 131	0
All	All	5816/6163 (94%)	-0.11	182 (3%) 49 32	29, 68, 128, 194	0

The worst 5 of 182 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	N	592	ILE	9.3
2	N	12	SER	8.6
2	P	12	SER	7.9
2	L	359	GLU	7.5
2	F	547	SER	7.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	PO4	H	1102	5/5	0.90	0.18	72,73,108,121	0
5	PO4	D	1104	5/5	0.91	0.21	49,60,85,91	0
5	PO4	B	1102	5/5	0.91	0.23	49,75,81,91	0
5	PO4	L	1104	5/5	0.91	0.21	52,60,91,94	0
5	PO4	N	1102	5/5	0.91	0.26	64,78,83,116	0
5	PO4	N	1104	5/5	0.92	0.29	56,57,89,100	0
5	PO4	D	1102	5/5	0.93	0.22	55,73,86,95	0
5	PO4	H	1104	5/5	0.93	0.23	57,64,69,95	0
5	PO4	J	1104	5/5	0.93	0.22	57,60,82,86	0
5	PO4	P	1103	5/5	0.93	0.21	47,55,70,76	0
5	PO4	H	1101	5/5	0.94	0.18	65,80,94,96	0
5	PO4	N	1101	5/5	0.94	0.22	42,48,74,75	0
5	PO4	B	1104	5/5	0.94	0.16	47,63,91,96	0
4	7JA	N	1100	23/23	0.94	0.23	49,61,73,86	0
4	7JA	H	1100	23/23	0.94	0.30	38,62,77,81	0
5	PO4	P	1104	5/5	0.94	0.22	50,58,89,93	0
5	PO4	F	1102	5/5	0.95	0.20	56,74,78,96	0

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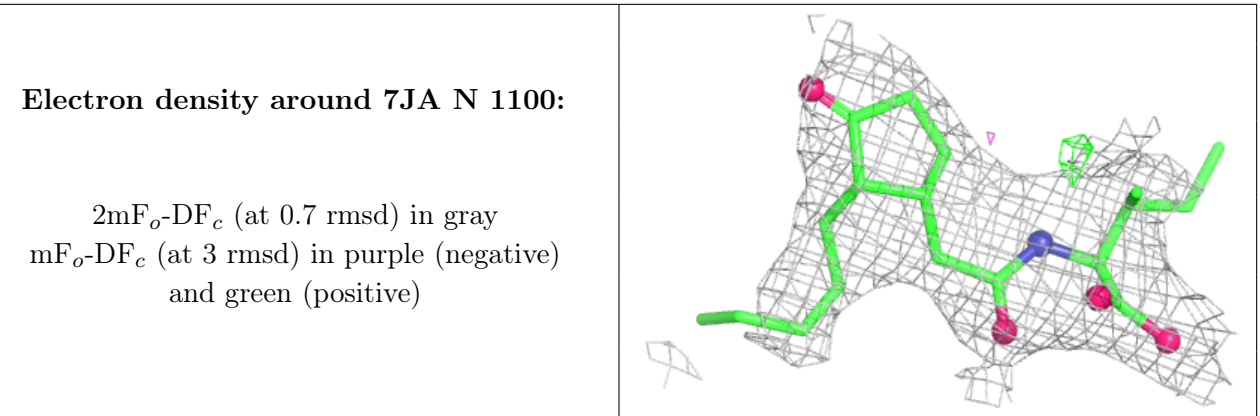
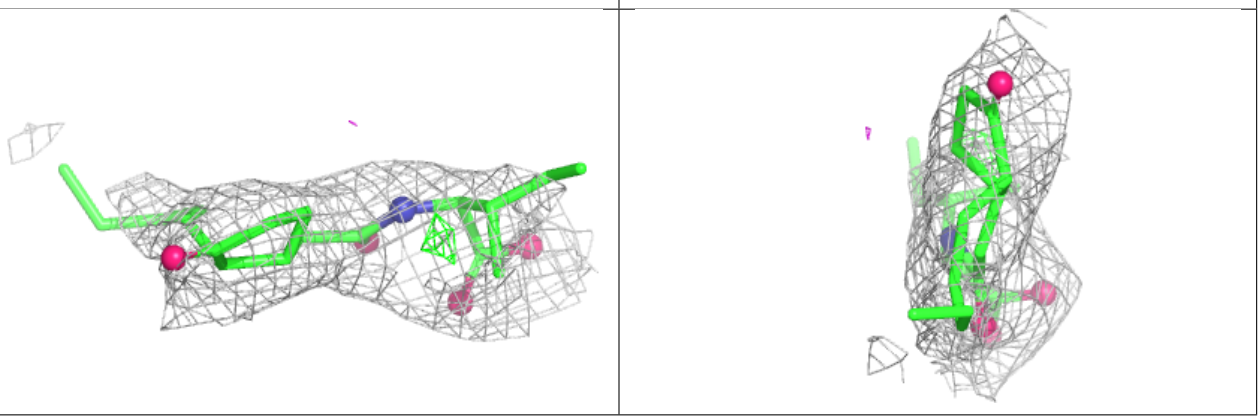
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	PO4	F	1104	5/5	0.95	0.20	48,54,80,83	0
4	7JA	B	1100	23/23	0.95	0.27	34,55,70,87	0
4	7JA	L	1100	23/23	0.95	0.23	42,58,72,86	0
5	PO4	P	1102	5/5	0.95	0.18	63,72,83,106	0
4	7JA	F	1100	23/23	0.95	0.27	42,56,70,88	0
4	7JA	P	1100	23/23	0.95	0.25	47,59,73,85	0
5	PO4	L	1102	5/5	0.96	0.30	64,67,83,96	0
4	7JA	J	1100	23/23	0.96	0.24	39,55,72,83	0
5	PO4	J	1102	5/5	0.96	0.24	53,74,83,101	0
5	PO4	H	1103	5/5	0.96	0.16	35,56,67,68	0
5	PO4	J	1101	5/5	0.97	0.20	37,45,66,73	0
5	PO4	F	1103	5/5	0.97	0.25	44,47,48,69	0
5	PO4	J	1103	5/5	0.97	0.23	42,45,52,68	0
5	PO4	N	1103	5/5	0.97	0.22	48,51,62,80	0
5	PO4	B	1101	5/5	0.97	0.20	35,48,61,72	0
5	PO4	L	1101	5/5	0.97	0.27	36,48,65,73	0
4	7JA	D	1100	23/23	0.97	0.24	37,55,68,85	0
5	PO4	L	1103	5/5	0.97	0.24	45,48,58,71	0
5	PO4	P	1101	5/5	0.98	0.24	40,51,70,73	0
5	PO4	B	1103	5/5	0.98	0.24	41,45,51,66	0
5	PO4	F	1101	5/5	0.98	0.22	40,41,55,77	0
5	PO4	D	1103	5/5	0.98	0.23	38,46,52,75	0
5	PO4	D	1101	5/5	0.99	0.21	42,45,58,71	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 7JA N 1100:

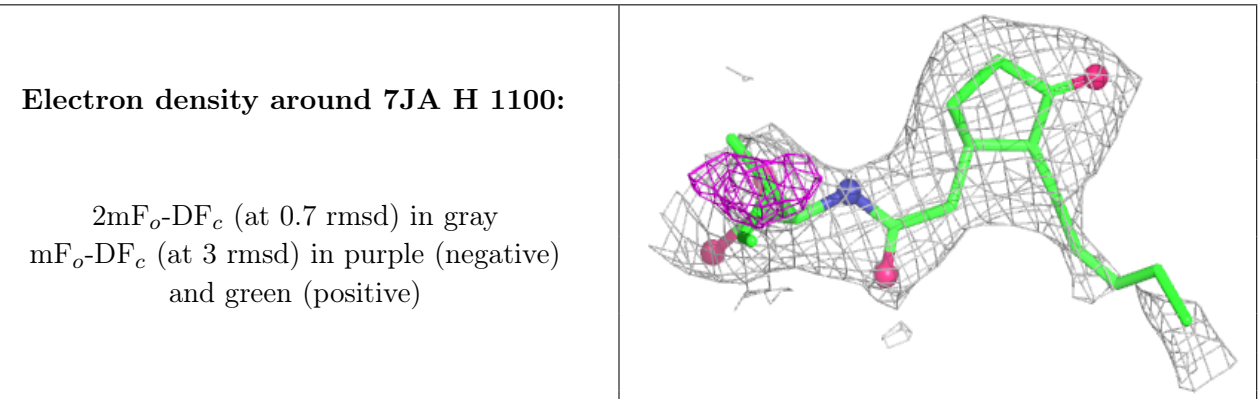
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

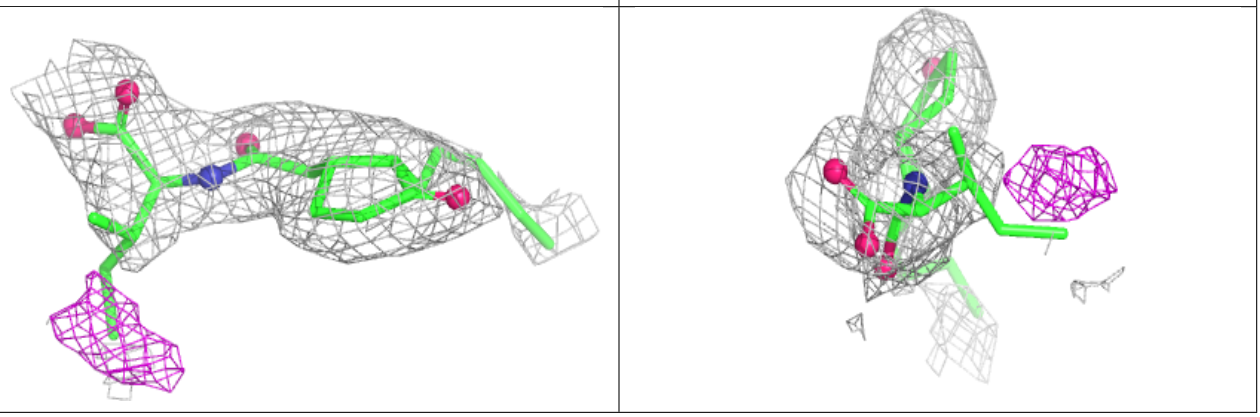




Electron density around 7JA H 1100:

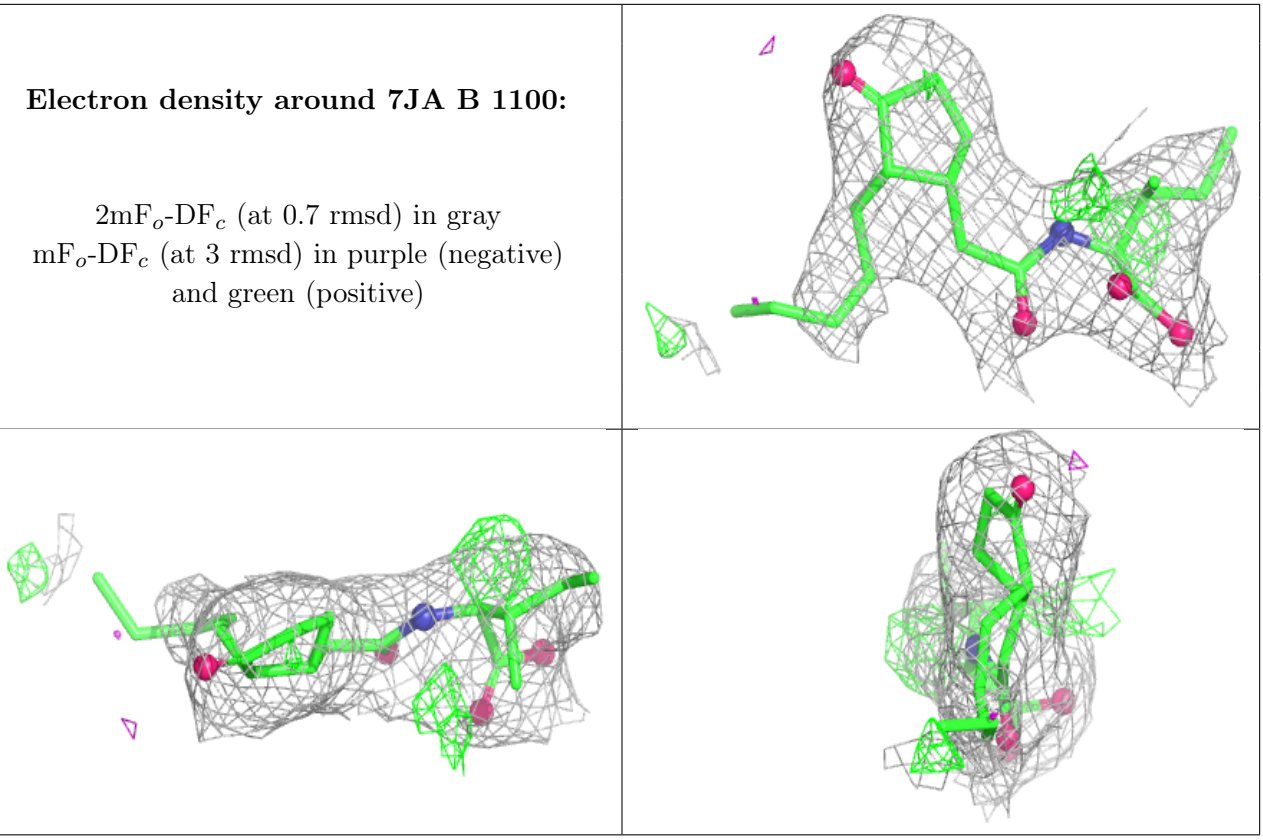
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





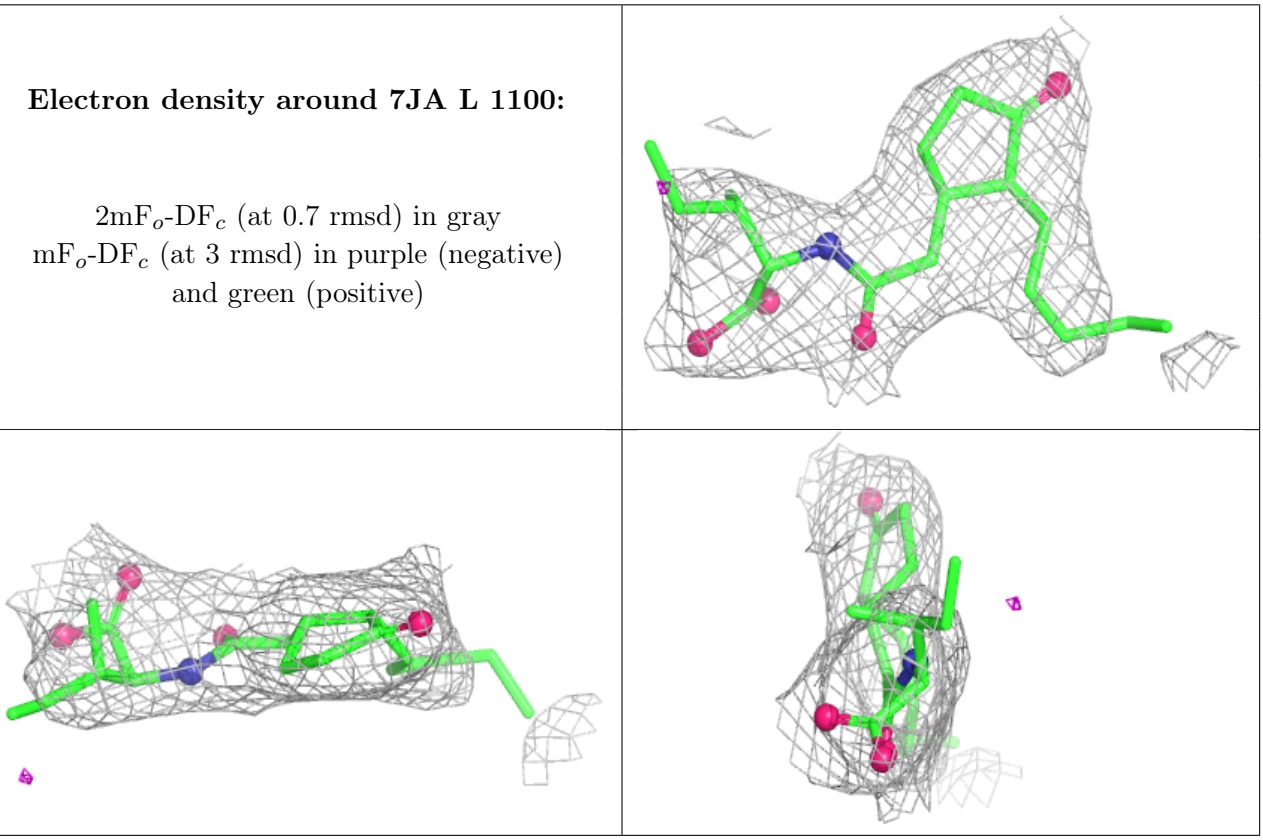
Electron density around 7JA B 1100:

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



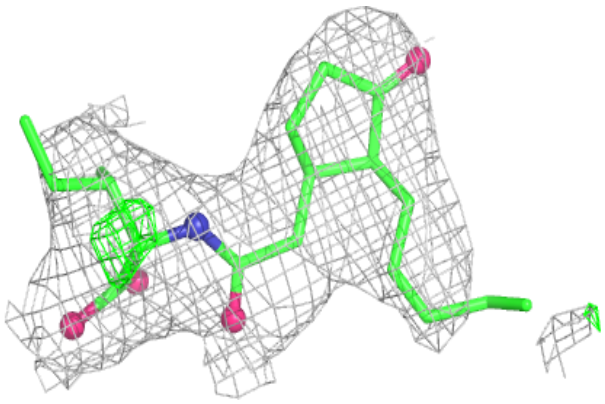
Electron density around 7JA L 1100:

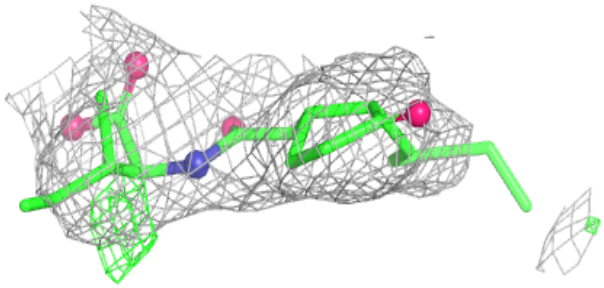
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

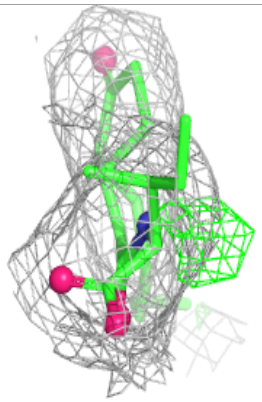


Electron density around 7JA F 1100:

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

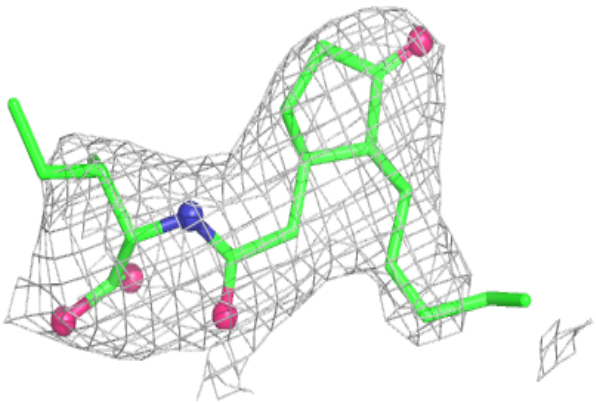


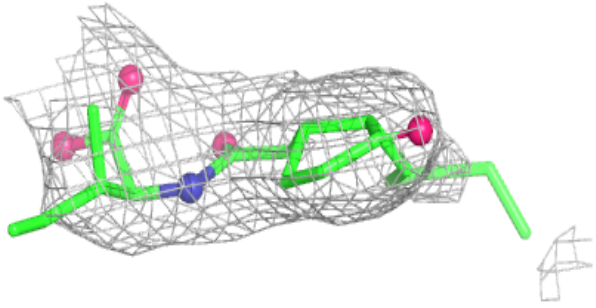


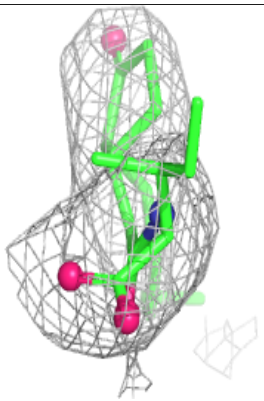


Electron density around 7JA P 1100:

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

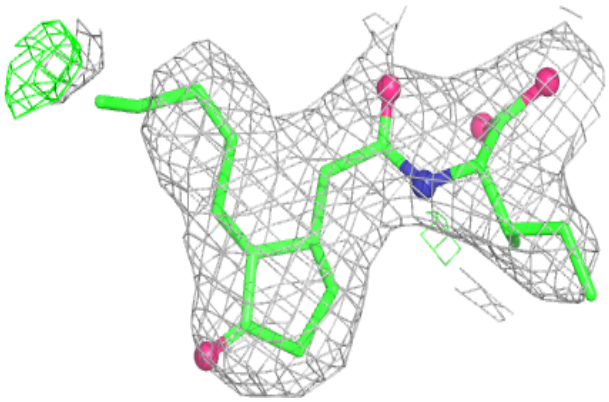


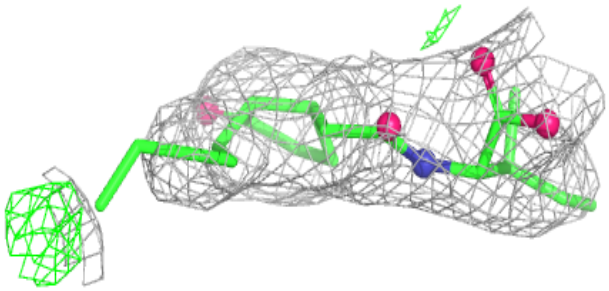


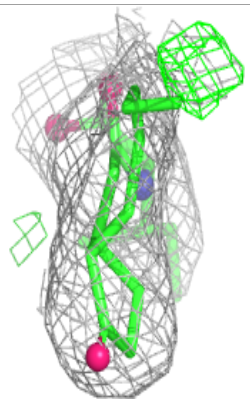


Electron density around 7JA J 1100:

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

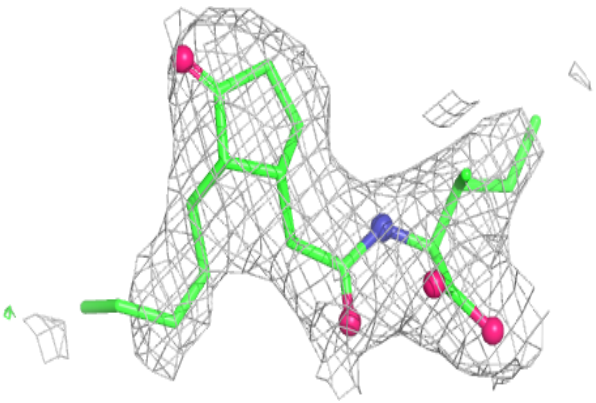


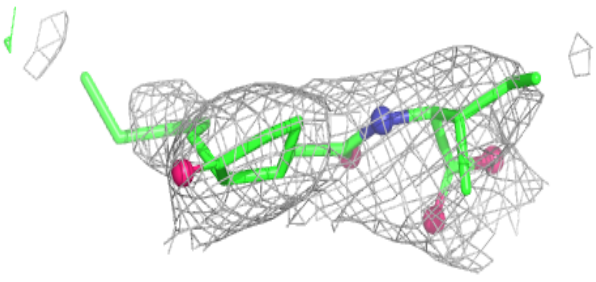


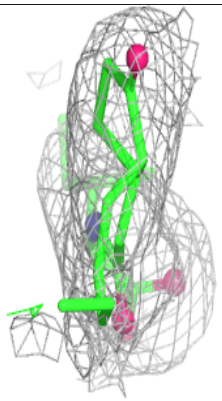


Electron density around 7JA D 1100:

$2mF_o$-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.