Full wwPDB X-ray Structure Validation Report (i)

Jun 23, 2026 – 10:48 AM EDT

PDB ID	:	9YUF / pdb_00009yuf
Title	:	PKR kinase domain - Dabrafenib complex
Authors	:	Yin, J.Z.; Sicheri, F.
Deposited on	:	2025-10-22
Resolution	:	2.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (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:

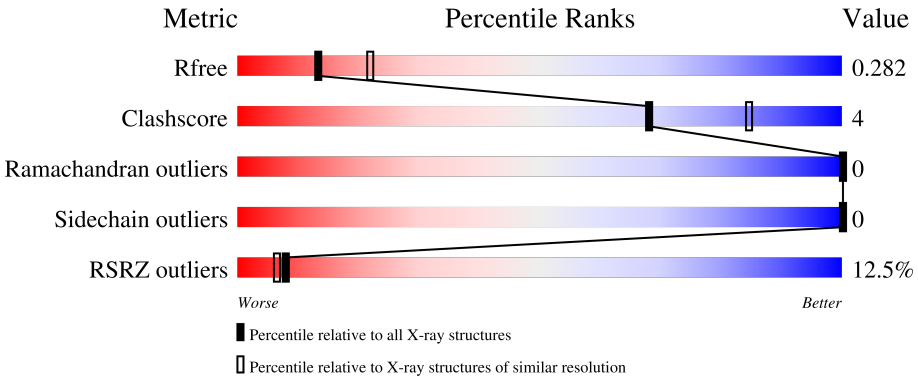
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 (i)

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

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	283	11% 80% 8% 12%
1	B	283	12% 81% 7% 12%
1	C	283	11% 80% 8% 12%
1	D	283	11% 81% 7% 12%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 7292 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 Interferon-induced, double-stranded RNA-activated protein kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	248	Total	C	N	O	S	0	0	0
			1788	1142	298	342	6			
1	B	248	Total	C	N	O	S	0	0	0
			1788	1142	298	342	6			
1	C	248	Total	C	N	O	S	0	0	0
			1788	1142	298	342	6			
1	D	248	Total	C	N	O	S	0	0	0
			1788	1142	298	342	6			

There are 192 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	256	ALA	-	expression tag	UNP B7ZKK7
A	257	HIS	-	expression tag	UNP B7ZKK7
A	?	-	ASP	deletion	UNP B7ZKK7
A	?	-	ASP	deletion	UNP B7ZKK7
A	?	-	SER	deletion	UNP B7ZKK7
A	?	-	LEU	deletion	UNP B7ZKK7
A	?	-	GLU	deletion	UNP B7ZKK7
A	?	-	SER	deletion	UNP B7ZKK7
A	?	-	SER	deletion	UNP B7ZKK7
A	?	-	ASP	deletion	UNP B7ZKK7
A	?	-	TYR	deletion	UNP B7ZKK7
A	?	-	ASP	deletion	UNP B7ZKK7
A	?	-	PRO	deletion	UNP B7ZKK7
A	?	-	GLU	deletion	UNP B7ZKK7
A	?	-	ASN	deletion	UNP B7ZKK7
A	412	ASN	HIS	conflict	UNP B7ZKK7
A	437	ASP	THR	conflict	UNP B7ZKK7
A	438	THR	SER	conflict	UNP B7ZKK7
A	439	LYS	LEU	conflict	UNP B7ZKK7
A	440	GLN	LYS	conflict	UNP B7ZKK7

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Chain	Residue	Modelled	Actual	Comment	Reference
A	441	VAL	ASN	conflict	UNP B7ZKK7
A	442	LYS	ASP	conflict	UNP B7ZKK7
A	443	ILE	GLY	conflict	UNP B7ZKK7
A	444	GLY	LYS	conflict	UNP B7ZKK7
A	445	ASP	ARG	conflict	UNP B7ZKK7
A	446	PHE	THR	conflict	UNP B7ZKK7
A	447	GLY	ARG	conflict	UNP B7ZKK7
A	448	LEU	SER	conflict	UNP B7ZKK7
A	449	VAL	LYS	conflict	UNP B7ZKK7
A	450	THR	GLY	conflict	UNP B7ZKK7
A	462	LYS	SER	conflict	UNP B7ZKK7
A	463	GLY	GLN	conflict	UNP B7ZKK7
A	512	LYS	-	insertion	UNP B7ZKK7
A	513	THR	-	insertion	UNP B7ZKK7
A	514	LEU	-	insertion	UNP B7ZKK7
A	515	LEU	-	insertion	UNP B7ZKK7
A	516	GLN	-	insertion	UNP B7ZKK7
A	541	ASN	-	expression tag	UNP B7ZKK7
A	542	THR	-	expression tag	UNP B7ZKK7
A	543	SER	-	expression tag	UNP B7ZKK7
A	544	GLU	-	expression tag	UNP B7ZKK7
A	545	ILE	-	expression tag	UNP B7ZKK7
A	546	LEU	-	expression tag	UNP B7ZKK7
A	547	ARG	-	expression tag	UNP B7ZKK7
A	548	THR	-	expression tag	UNP B7ZKK7
A	549	LEU	-	expression tag	UNP B7ZKK7
A	550	THR	-	expression tag	UNP B7ZKK7
A	551	VAL	-	expression tag	UNP B7ZKK7
B	256	ALA	-	expression tag	UNP B7ZKK7
B	257	HIS	-	expression tag	UNP B7ZKK7
B	?	-	ASP	deletion	UNP B7ZKK7
B	?	-	ASP	deletion	UNP B7ZKK7
B	?	-	SER	deletion	UNP B7ZKK7
B	?	-	LEU	deletion	UNP B7ZKK7
B	?	-	GLU	deletion	UNP B7ZKK7
B	?	-	SER	deletion	UNP B7ZKK7
B	?	-	SER	deletion	UNP B7ZKK7
B	?	-	ASP	deletion	UNP B7ZKK7
B	?	-	TYR	deletion	UNP B7ZKK7
B	?	-	ASP	deletion	UNP B7ZKK7
B	?	-	PRO	deletion	UNP B7ZKK7
B	?	-	GLU	deletion	UNP B7ZKK7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	?	-	ASN	deletion	UNP B7ZKK7
B	412	ASN	HIS	conflict	UNP B7ZKK7
B	437	ASP	THR	conflict	UNP B7ZKK7
B	438	THR	SER	conflict	UNP B7ZKK7
B	439	LYS	LEU	conflict	UNP B7ZKK7
B	440	GLN	LYS	conflict	UNP B7ZKK7
B	441	VAL	ASN	conflict	UNP B7ZKK7
B	442	LYS	ASP	conflict	UNP B7ZKK7
B	443	ILE	GLY	conflict	UNP B7ZKK7
B	444	GLY	LYS	conflict	UNP B7ZKK7
B	445	ASP	ARG	conflict	UNP B7ZKK7
B	446	PHE	THR	conflict	UNP B7ZKK7
B	447	GLY	ARG	conflict	UNP B7ZKK7
B	448	LEU	SER	conflict	UNP B7ZKK7
B	449	VAL	LYS	conflict	UNP B7ZKK7
B	450	THR	GLY	conflict	UNP B7ZKK7
B	462	LYS	SER	conflict	UNP B7ZKK7
B	463	GLY	GLN	conflict	UNP B7ZKK7
B	512	LYS	-	insertion	UNP B7ZKK7
B	513	THR	-	insertion	UNP B7ZKK7
B	514	LEU	-	insertion	UNP B7ZKK7
B	515	LEU	-	insertion	UNP B7ZKK7
B	516	GLN	-	insertion	UNP B7ZKK7
B	541	ASN	-	expression tag	UNP B7ZKK7
B	542	THR	-	expression tag	UNP B7ZKK7
B	543	SER	-	expression tag	UNP B7ZKK7
B	544	GLU	-	expression tag	UNP B7ZKK7
B	545	ILE	-	expression tag	UNP B7ZKK7
B	546	LEU	-	expression tag	UNP B7ZKK7
B	547	ARG	-	expression tag	UNP B7ZKK7
B	548	THR	-	expression tag	UNP B7ZKK7
B	549	LEU	-	expression tag	UNP B7ZKK7
B	550	THR	-	expression tag	UNP B7ZKK7
B	551	VAL	-	expression tag	UNP B7ZKK7
C	256	ALA	-	expression tag	UNP B7ZKK7
C	257	HIS	-	expression tag	UNP B7ZKK7
C	?	-	ASP	deletion	UNP B7ZKK7
C	?	-	ASP	deletion	UNP B7ZKK7
C	?	-	SER	deletion	UNP B7ZKK7
C	?	-	LEU	deletion	UNP B7ZKK7
C	?	-	GLU	deletion	UNP B7ZKK7
C	?	-	SER	deletion	UNP B7ZKK7

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Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	SER	deletion	UNP B7ZKK7
C	?	-	ASP	deletion	UNP B7ZKK7
C	?	-	TYR	deletion	UNP B7ZKK7
C	?	-	ASP	deletion	UNP B7ZKK7
C	?	-	PRO	deletion	UNP B7ZKK7
C	?	-	GLU	deletion	UNP B7ZKK7
C	?	-	ASN	deletion	UNP B7ZKK7
C	412	ASN	HIS	conflict	UNP B7ZKK7
C	437	ASP	THR	conflict	UNP B7ZKK7
C	438	THR	SER	conflict	UNP B7ZKK7
C	439	LYS	LEU	conflict	UNP B7ZKK7
C	440	GLN	LYS	conflict	UNP B7ZKK7
C	441	VAL	ASN	conflict	UNP B7ZKK7
C	442	LYS	ASP	conflict	UNP B7ZKK7
C	443	ILE	GLY	conflict	UNP B7ZKK7
C	444	GLY	LYS	conflict	UNP B7ZKK7
C	445	ASP	ARG	conflict	UNP B7ZKK7
C	446	PHE	THR	conflict	UNP B7ZKK7
C	447	GLY	ARG	conflict	UNP B7ZKK7
C	448	LEU	SER	conflict	UNP B7ZKK7
C	449	VAL	LYS	conflict	UNP B7ZKK7
C	450	THR	GLY	conflict	UNP B7ZKK7
C	462	LYS	SER	conflict	UNP B7ZKK7
C	463	GLY	GLN	conflict	UNP B7ZKK7
C	512	LYS	-	insertion	UNP B7ZKK7
C	513	THR	-	insertion	UNP B7ZKK7
C	514	LEU	-	insertion	UNP B7ZKK7
C	515	LEU	-	insertion	UNP B7ZKK7
C	516	GLN	-	insertion	UNP B7ZKK7
C	541	ASN	-	expression tag	UNP B7ZKK7
C	542	THR	-	expression tag	UNP B7ZKK7
C	543	SER	-	expression tag	UNP B7ZKK7
C	544	GLU	-	expression tag	UNP B7ZKK7
C	545	ILE	-	expression tag	UNP B7ZKK7
C	546	LEU	-	expression tag	UNP B7ZKK7
C	547	ARG	-	expression tag	UNP B7ZKK7
C	548	THR	-	expression tag	UNP B7ZKK7
C	549	LEU	-	expression tag	UNP B7ZKK7
C	550	THR	-	expression tag	UNP B7ZKK7
C	551	VAL	-	expression tag	UNP B7ZKK7
D	256	ALA	-	expression tag	UNP B7ZKK7
D	257	HIS	-	expression tag	UNP B7ZKK7

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Chain	Residue	Modelled	Actual	Comment	Reference
D	?	-	ASP	deletion	UNP B7ZKK7
D	?	-	ASP	deletion	UNP B7ZKK7
D	?	-	SER	deletion	UNP B7ZKK7
D	?	-	LEU	deletion	UNP B7ZKK7
D	?	-	GLU	deletion	UNP B7ZKK7
D	?	-	SER	deletion	UNP B7ZKK7
D	?	-	SER	deletion	UNP B7ZKK7
D	?	-	ASP	deletion	UNP B7ZKK7
D	?	-	TYR	deletion	UNP B7ZKK7
D	?	-	ASP	deletion	UNP B7ZKK7
D	?	-	PRO	deletion	UNP B7ZKK7
D	?	-	GLU	deletion	UNP B7ZKK7
D	?	-	ASN	deletion	UNP B7ZKK7
D	412	ASN	HIS	conflict	UNP B7ZKK7
D	437	ASP	THR	conflict	UNP B7ZKK7
D	438	THR	SER	conflict	UNP B7ZKK7
D	439	LYS	LEU	conflict	UNP B7ZKK7
D	440	GLN	LYS	conflict	UNP B7ZKK7
D	441	VAL	ASN	conflict	UNP B7ZKK7
D	442	LYS	ASP	conflict	UNP B7ZKK7
D	443	ILE	GLY	conflict	UNP B7ZKK7
D	444	GLY	LYS	conflict	UNP B7ZKK7
D	445	ASP	ARG	conflict	UNP B7ZKK7
D	446	PHE	THR	conflict	UNP B7ZKK7
D	447	GLY	ARG	conflict	UNP B7ZKK7
D	448	LEU	SER	conflict	UNP B7ZKK7
D	449	VAL	LYS	conflict	UNP B7ZKK7
D	450	THR	GLY	conflict	UNP B7ZKK7
D	462	LYS	SER	conflict	UNP B7ZKK7
D	463	GLY	GLN	conflict	UNP B7ZKK7
D	512	LYS	-	insertion	UNP B7ZKK7
D	513	THR	-	insertion	UNP B7ZKK7
D	514	LEU	-	insertion	UNP B7ZKK7
D	515	LEU	-	insertion	UNP B7ZKK7
D	516	GLN	-	insertion	UNP B7ZKK7
D	541	ASN	-	expression tag	UNP B7ZKK7
D	542	THR	-	expression tag	UNP B7ZKK7
D	543	SER	-	expression tag	UNP B7ZKK7
D	544	GLU	-	expression tag	UNP B7ZKK7
D	545	ILE	-	expression tag	UNP B7ZKK7
D	546	LEU	-	expression tag	UNP B7ZKK7
D	547	ARG	-	expression tag	UNP B7ZKK7

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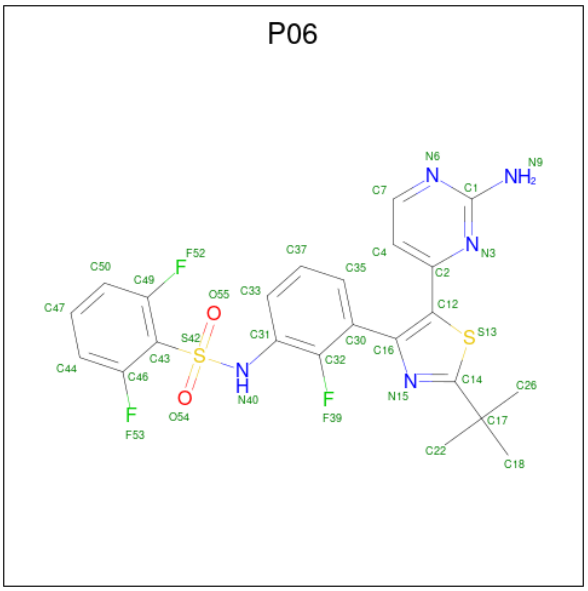
Chain	Residue	Modelled	Actual	Comment	Reference
D	548	THR	-	expression tag	UNP B7ZKK7
D	549	LEU	-	expression tag	UNP B7ZKK7
D	550	THR	-	expression tag	UNP B7ZKK7
D	551	VAL	-	expression tag	UNP B7ZKK7

- Molecule 2 is Dabrafenib (CCD ID: P06) (formula: $C_{23}H_{20}F_3N_5O_2S_2$) (labeled as "Ligand of Interest" by depositor).



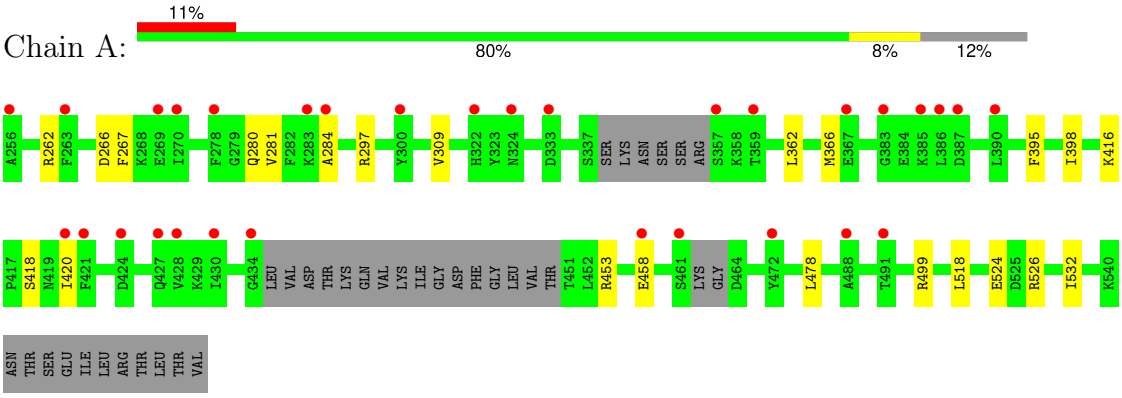
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	F	N	O	S	0	0
			35	23	3	5	2	2		
2	B	1	Total	C	F	N	O	S	0	0
			35	23	3	5	2	2		
2	C	1	Total	C	F	N	O	S	0	0
			35	23	3	5	2	2		
2	D	1	Total	C	F	N	O	S	0	0
			35	23	3	5	2	2		

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.

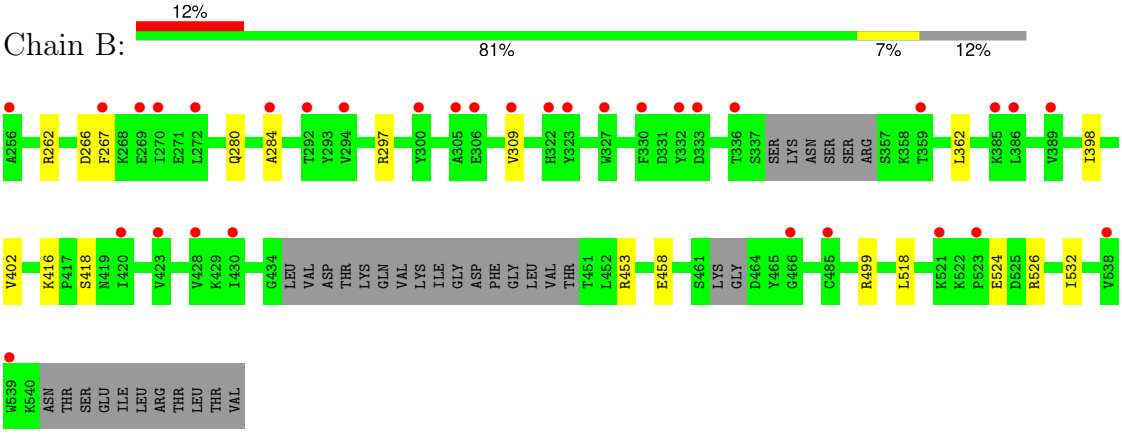
• Molecule 1: Interferon-induced, double-stranded RNA-activated protein kinase

Chain A:



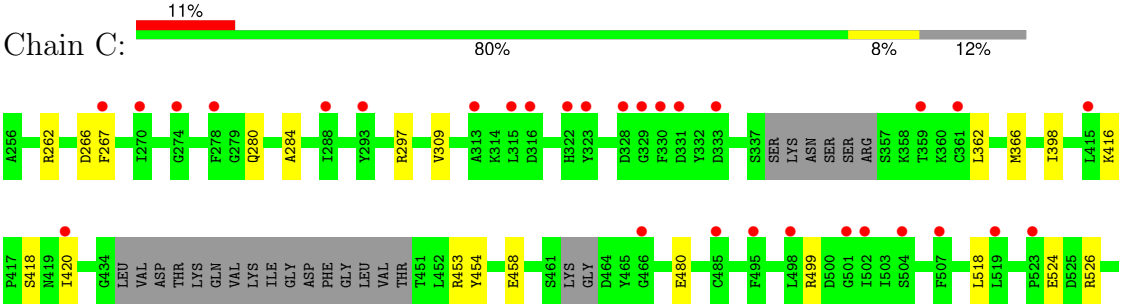
• Molecule 1: Interferon-induced, double-stranded RNA-activated protein kinase

Chain B:



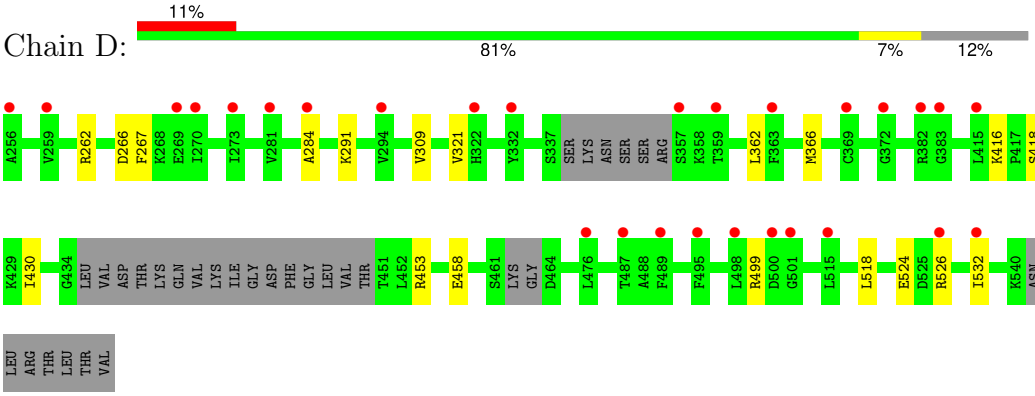
• Molecule 1: Interferon-induced, double-stranded RNA-activated protein kinase

Chain C:



• Molecule 1: Interferon-induced, double-stranded RNA-activated protein kinase

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α, β, γ	95.33Å 95.33Å 122.97Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	68.54 – 2.50 68.54 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.8 (68.54-2.50) 99.8 (68.54-2.50)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.15 (at 2.51Å)	Xtriage
Refinement program	PHENIX 1.21.1_5286	Depositor
R, R_{free}	0.255 , 0.280 0.257 , 0.282	Depositor DCC
R_{free} test set	2157 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	90.6	Xtriage
Anisotropy	0.137	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 191.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	0.488 for -h,-k,l 0.488 for h,-h-k,-l 0.488 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	7292	wwPDB-VP
Average B, all atoms (Å^2)	111.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.58% 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: P06

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	0.08	0/1821	0.24	0/2484
1	B	0.07	0/1821	0.24	0/2484
1	C	0.07	0/1821	0.24	0/2484
1	D	0.08	0/1821	0.24	0/2484
All	All	0.08	0/7284	0.24	0/9936

There are no bond length outliers.

There are no bond angle outliers.

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	1788	0	1542	15	0
1	B	1788	0	1542	12	0
1	C	1788	0	1542	14	0
1	D	1788	0	1542	13	0
2	A	35	0	20	2	0
2	B	35	0	20	0	0
2	C	35	0	20	1	0
2	D	35	0	20	1	0
All	All	7292	0	6248	48	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 4.

All (48) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:416:LYS:HG3	1:D:418:SER:HB3	1.87	0.56
1:C:416:LYS:HG3	1:C:418:SER:HB3	1.88	0.55
1:C:458:GLU:OE2	1:C:526:ARG:NH2	2.38	0.54
1:A:262:ARG:HH12	1:C:266:ASP:CG	2.15	0.54
1:D:453:ARG:O	1:D:499:ARG:NH1	2.42	0.52
1:B:416:LYS:HG3	1:B:418:SER:HB3	1.90	0.52
1:B:309:VAL:HG21	1:B:362:LEU:HD21	1.91	0.52
1:A:416:LYS:HG3	1:A:418:SER:HB3	1.92	0.52
1:D:309:VAL:HG21	1:D:362:LEU:HD21	1.92	0.52
1:B:262:ARG:HH12	1:D:266:ASP:CG	2.18	0.51
1:B:266:ASP:CG	1:D:262:ARG:HH12	2.18	0.51
1:C:309:VAL:HG21	1:C:362:LEU:HD21	1.92	0.51
1:A:266:ASP:CG	1:C:262:ARG:HH12	2.19	0.51
1:A:453:ARG:O	1:A:499:ARG:NH1	2.45	0.50
1:B:518:LEU:HD21	1:B:532:ILE:HD11	1.92	0.50
1:C:518:LEU:HD21	1:C:532:ILE:HD11	1.94	0.50
1:A:309:VAL:HG21	1:A:362:LEU:HD21	1.94	0.49
1:A:518:LEU:HD21	1:A:532:ILE:HD11	1.95	0.49
1:A:458:GLU:OE2	1:A:526:ARG:NH2	2.43	0.48
1:B:453:ARG:O	1:B:499:ARG:NH1	2.46	0.47
1:A:280:GLN:OE1	1:A:297:ARG:NH2	2.47	0.47
1:D:518:LEU:HD21	1:D:532:ILE:HD11	1.97	0.46
1:B:280:GLN:OE1	1:B:297:ARG:NH2	2.49	0.45
1:B:458:GLU:OE2	1:B:526:ARG:NH2	2.43	0.45
1:C:280:GLN:OE1	1:C:297:ARG:NH2	2.50	0.44
1:B:267:PHE:HB3	1:B:284:ALA:HB1	1.99	0.44
1:A:266:ASP:OD2	1:C:262:ARG:NH2	2.45	0.43
1:A:395:PHE:CE1	1:A:478:LEU:HB2	2.53	0.43
1:B:524:GLU:CD	1:B:524:GLU:H	2.26	0.43
1:C:453:ARG:O	1:C:499:ARG:NH1	2.48	0.43
1:A:524:GLU:H	1:A:524:GLU:CD	2.26	0.43
1:D:524:GLU:H	1:D:524:GLU:CD	2.26	0.42
1:A:281:VAL:HG21	2:A:601:P06:N15	2.34	0.42
1:D:458:GLU:OE2	1:D:526:ARG:NH2	2.46	0.42
1:D:366:MET:HG3	2:D:601:P06:C37	2.50	0.42
1:D:267:PHE:HB3	1:D:284:ALA:HB1	2.01	0.42
1:B:398:ILE:O	1:B:402:VAL:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:398:ILE:HD13	1:A:420:ILE:HD13	2.02	0.41
1:C:524:GLU:H	1:C:524:GLU:CD	2.27	0.41
1:B:266:ASP:OD2	1:D:262:ARG:NH2	2.52	0.41
1:C:267:PHE:HB3	1:C:284:ALA:HB1	2.03	0.41
1:C:366:MET:HG3	2:C:601:P06:C37	2.50	0.41
1:C:398:ILE:HD13	1:C:420:ILE:HD13	2.03	0.41
1:A:267:PHE:HB3	1:A:284:ALA:HB1	2.03	0.41
1:A:366:MET:HG3	2:A:601:P06:C37	2.51	0.41
1:D:291:LYS:HB3	1:D:291:LYS:HE2	1.88	0.40
1:C:454:TYR:OH	1:C:480:GLU:OE1	2.33	0.40
1:D:321:VAL:HG22	1:D:430:ILE:O	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	240/283 (85%)	237 (99%)	3 (1%)	0	100	100
1	B	240/283 (85%)	237 (99%)	3 (1%)	0	100	100
1	C	240/283 (85%)	237 (99%)	3 (1%)	0	100	100
1	D	240/283 (85%)	237 (99%)	3 (1%)	0	100	100
All	All	960/1132 (85%)	948 (99%)	12 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	158/255 (62%)	158 (100%)	0	100	100
1	B	158/255 (62%)	158 (100%)	0	100	100
1	C	158/255 (62%)	158 (100%)	0	100	100
1	D	158/255 (62%)	158 (100%)	0	100	100
All	All	632/1020 (62%)	632 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	322	HIS
1	C	322	HIS

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	$\#\|Z\| > 2$
2	P06	D	601	-	38,38,38	1.78	9 (23%)	52,58,58	1.74	13 (25%)
2	P06	C	601	-	38,38,38	1.83	9 (23%)	52,58,58	1.78	13 (25%)
2	P06	B	601	-	38,38,38	1.82	9 (23%)	52,58,58	1.75	13 (25%)
2	P06	A	601	-	38,38,38	1.81	9 (23%)	52,58,58	1.77	13 (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	P06	D	601	-	-	7/25/25/25	0/4/4/4
2	P06	C	601	-	-	7/25/25/25	0/4/4/4
2	P06	B	601	-	-	7/25/25/25	0/4/4/4
2	P06	A	601	-	-	7/25/25/25	0/4/4/4

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	P06	C43-S42	-4.17	1.72	1.78
2	A	601	P06	C16-N15	4.16	1.45	1.38
2	C	601	P06	C16-N15	4.14	1.45	1.38
2	B	601	P06	C16-N15	4.10	1.45	1.38
2	C	601	P06	C43-S42	-3.95	1.72	1.78
2	D	601	P06	C43-S42	-3.93	1.72	1.78
2	D	601	P06	C16-N15	3.84	1.44	1.38
2	A	601	P06	C43-S42	-3.78	1.73	1.78
2	C	601	P06	S42-N40	3.70	1.69	1.63
2	A	601	P06	S42-N40	3.66	1.69	1.63
2	B	601	P06	S42-N40	3.51	1.69	1.63
2	D	601	P06	S42-N40	3.35	1.68	1.63
2	C	601	P06	C31-C32	3.27	1.44	1.38
2	A	601	P06	C31-C32	3.27	1.44	1.38
2	B	601	P06	C31-C32	3.23	1.44	1.38
2	D	601	P06	C31-C32	3.21	1.44	1.38
2	C	601	P06	C17-C14	3.20	1.55	1.51
2	A	601	P06	C1-N6	3.17	1.39	1.35
2	B	601	P06	C1-N6	3.17	1.39	1.35
2	D	601	P06	C1-N6	3.14	1.39	1.35
2	C	601	P06	C1-N6	3.12	1.39	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	P06	C17-C14	2.83	1.54	1.51
2	D	601	P06	C17-C14	2.83	1.54	1.51
2	B	601	P06	C17-C14	2.78	1.54	1.51
2	C	601	P06	C30-C32	2.59	1.43	1.38
2	B	601	P06	C30-C32	2.58	1.43	1.38
2	A	601	P06	C30-C32	2.58	1.43	1.38
2	D	601	P06	C30-C32	2.56	1.43	1.38
2	D	601	P06	C1-N3	2.47	1.39	1.35
2	B	601	P06	F39-C32	-2.44	1.31	1.34
2	D	601	P06	F39-C32	-2.44	1.31	1.34
2	A	601	P06	F39-C32	-2.44	1.31	1.34
2	C	601	P06	F39-C32	-2.43	1.31	1.34
2	A	601	P06	C1-N3	2.39	1.39	1.35
2	B	601	P06	C1-N3	2.39	1.39	1.35
2	C	601	P06	C1-N3	2.32	1.39	1.35

All (52) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	601	P06	C22-C17-C14	4.85	115.79	109.24
2	C	601	P06	C22-C17-C14	4.84	115.77	109.24
2	B	601	P06	C22-C17-C14	4.82	115.74	109.24
2	D	601	P06	C22-C17-C14	4.58	115.42	109.24
2	C	601	P06	C12-C16-N15	-4.28	112.87	115.43
2	A	601	P06	C12-C16-N15	-4.25	112.89	115.43
2	B	601	P06	C12-C16-N15	-4.21	112.91	115.43
2	D	601	P06	C12-C16-N15	-4.02	113.03	115.43
2	D	601	P06	C16-N15-C14	3.47	113.96	110.55
2	C	601	P06	C16-N15-C14	3.41	113.90	110.55
2	A	601	P06	C16-N15-C14	3.33	113.83	110.55
2	B	601	P06	C16-N15-C14	3.33	113.82	110.55
2	C	601	P06	S13-C14-N15	-3.19	111.37	116.12
2	D	601	P06	S13-C14-N15	-3.15	111.43	116.12
2	A	601	P06	S13-C14-N15	-3.14	111.45	116.12
2	A	601	P06	C17-C14-S13	-3.13	116.25	121.51
2	B	601	P06	S13-C14-N15	-3.13	111.46	116.12
2	B	601	P06	C17-C14-S13	-3.08	116.34	121.51
2	D	601	P06	C26-C17-C14	3.08	113.39	109.24
2	C	601	P06	C26-C17-C14	3.05	113.36	109.24
2	B	601	P06	C2-C12-S13	-3.02	112.79	118.24
2	C	601	P06	C17-C14-S13	-3.01	116.46	121.51
2	A	601	P06	C2-C12-S13	-3.00	112.82	118.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	601	P06	C2-C12-S13	-2.98	112.86	118.24
2	D	601	P06	C2-C12-S13	-2.97	112.87	118.24
2	B	601	P06	C26-C17-C14	2.90	113.15	109.24
2	D	601	P06	C17-C14-S13	-2.85	116.72	121.51
2	A	601	P06	C26-C17-C14	2.78	112.98	109.24
2	A	601	P06	C18-C17-C14	2.42	112.51	109.24
2	D	601	P06	C18-C17-C14	2.38	112.45	109.24
2	B	601	P06	C18-C17-C14	2.31	112.36	109.24
2	C	601	P06	C18-C17-C14	2.27	112.30	109.24
2	A	601	P06	C31-N40-S42	2.24	130.51	123.34
2	B	601	P06	C31-N40-S42	2.22	130.44	123.34
2	D	601	P06	C35-C37-C33	2.20	123.07	120.24
2	B	601	P06	C35-C37-C33	2.17	123.04	120.24
2	C	601	P06	C26-C17-C18	-2.16	103.14	108.95
2	A	601	P06	C26-C17-C18	-2.15	103.17	108.95
2	C	601	P06	C35-C37-C33	2.15	123.01	120.24
2	A	601	P06	C35-C37-C33	2.15	123.00	120.24
2	D	601	P06	C31-N40-S42	2.14	130.19	123.34
2	C	601	P06	C31-N40-S42	2.13	130.15	123.34
2	D	601	P06	N9-C1-N6	-2.11	115.21	117.40
2	B	601	P06	C26-C17-C18	-2.11	103.30	108.95
2	C	601	P06	N9-C1-N6	-2.07	115.25	117.40
2	D	601	P06	C26-C17-C18	-2.06	103.42	108.95
2	A	601	P06	C7-N6-C1	-2.05	114.17	116.21
2	B	601	P06	C7-N6-C1	-2.05	114.17	116.21
2	D	601	P06	C7-N6-C1	-2.05	114.17	116.21
2	A	601	P06	N9-C1-N6	-2.05	115.28	117.40
2	C	601	P06	C7-N6-C1	-2.05	114.18	116.21
2	B	601	P06	N9-C1-N6	-2.02	115.30	117.40

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	P06	C12-C16-C30-C35
2	B	601	P06	C12-C16-C30-C35
2	C	601	P06	C12-C16-C30-C35
2	D	601	P06	C12-C16-C30-C35
2	A	601	P06	C31-N40-S42-O55
2	C	601	P06	C31-N40-S42-O55
2	D	601	P06	C31-N40-S42-O55
2	B	601	P06	C31-N40-S42-O55

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Mol	Chain	Res	Type	Atoms
2	C	601	P06	C31-N40-S42-O54
2	D	601	P06	C31-N40-S42-O54
2	A	601	P06	C31-N40-S42-O54
2	B	601	P06	C31-N40-S42-O54
2	C	601	P06	N15-C16-C30-C35
2	A	601	P06	N15-C16-C30-C32
2	B	601	P06	N15-C16-C30-C32
2	C	601	P06	N15-C16-C30-C32
2	D	601	P06	N15-C16-C30-C32
2	A	601	P06	C31-N40-S42-C43
2	C	601	P06	C31-N40-S42-C43
2	D	601	P06	C31-N40-S42-C43
2	B	601	P06	C31-N40-S42-C43
2	A	601	P06	C12-C16-C30-C32
2	B	601	P06	C12-C16-C30-C32
2	C	601	P06	C12-C16-C30-C32
2	D	601	P06	C12-C16-C30-C32
2	A	601	P06	N15-C16-C30-C35
2	B	601	P06	N15-C16-C30-C35
2	D	601	P06	N15-C16-C30-C35

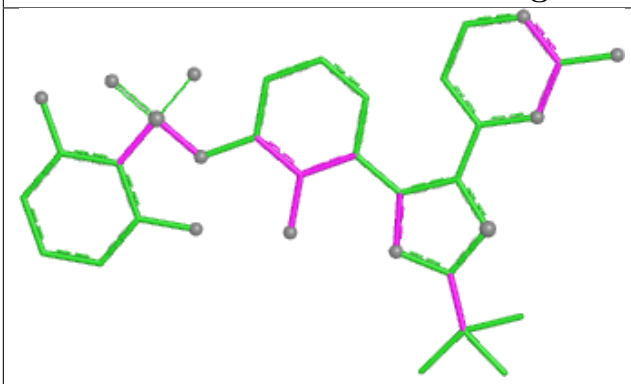
There are no ring outliers.

3 monomers are involved in 4 short contacts:

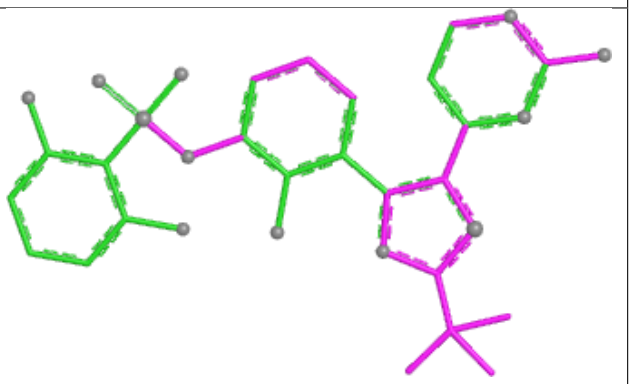
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	601	P06	1	0
2	C	601	P06	1	0
2	A	601	P06	2	0

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.

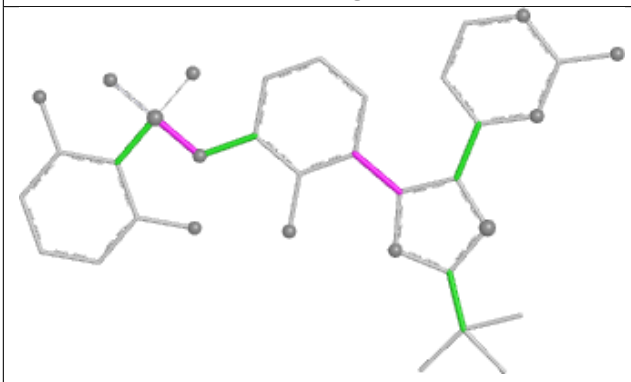
Ligand P06 D 601



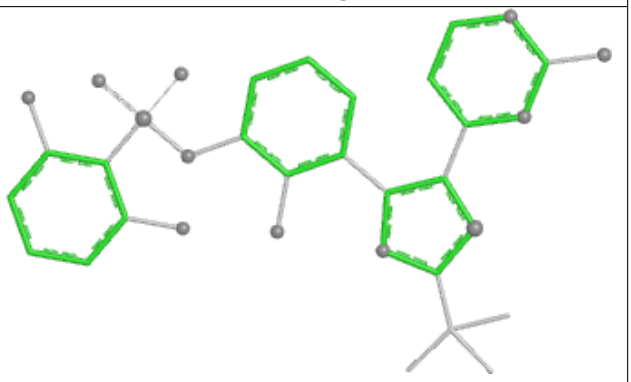
Bond lengths



Bond angles

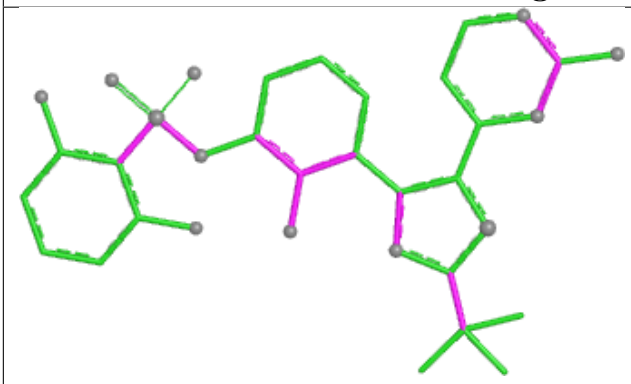


Torsions



Rings

Ligand P06 C 601



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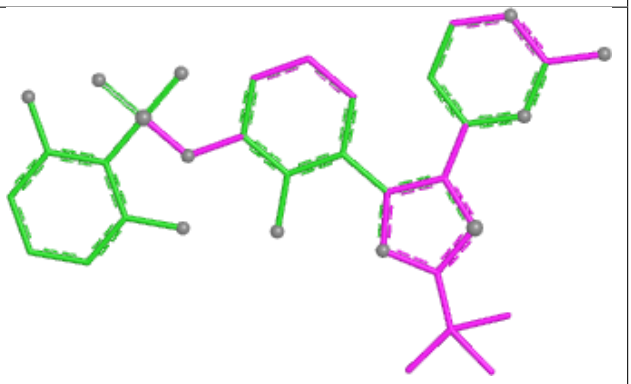
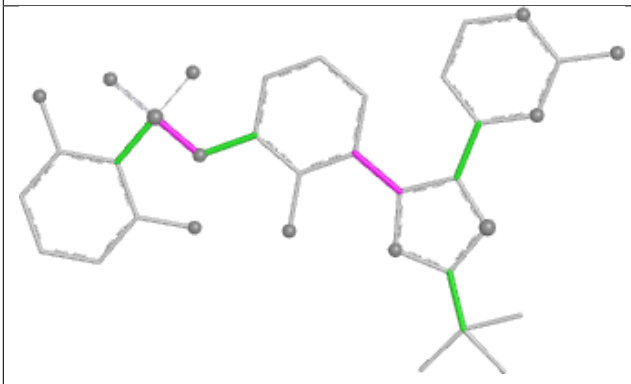


Bond angles



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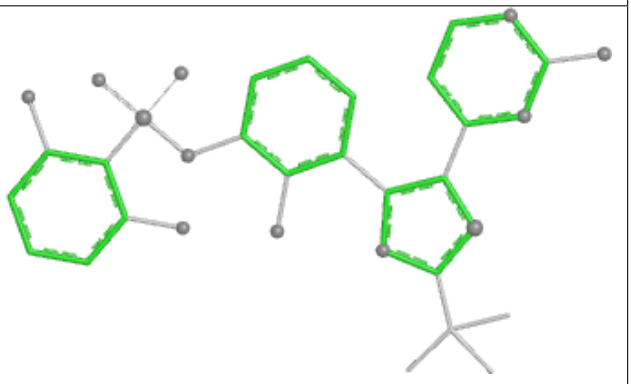
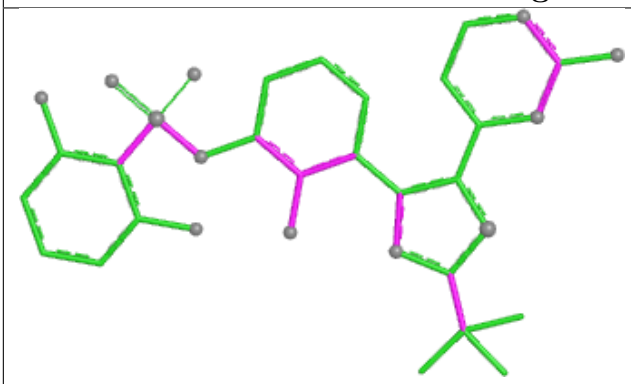
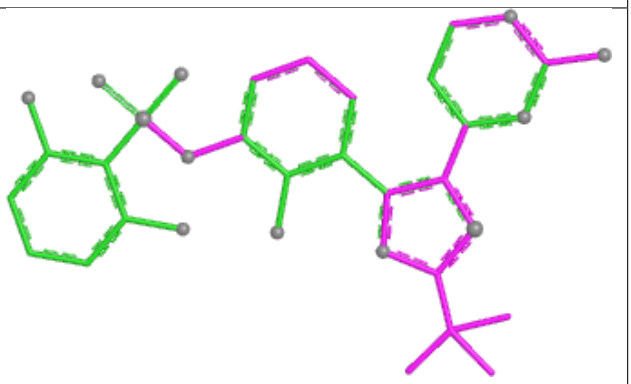


Rings

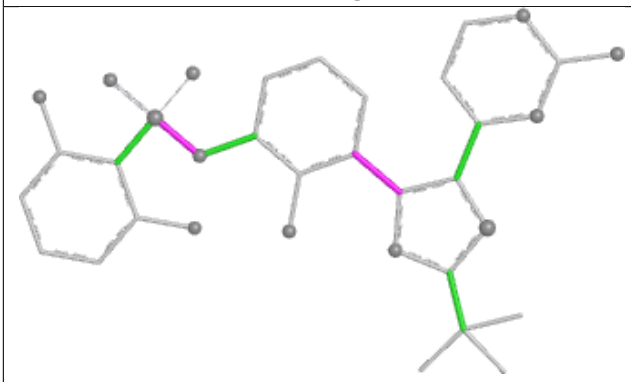
Ligand P06 B 601



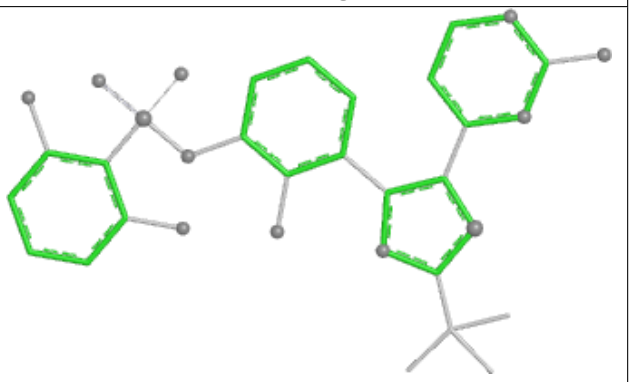
Bond lengths



Bond angles

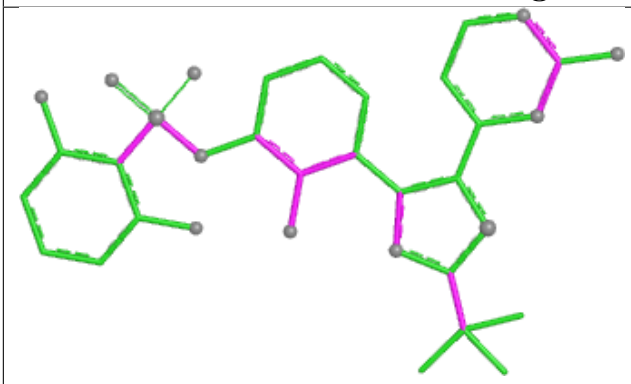


Torsions

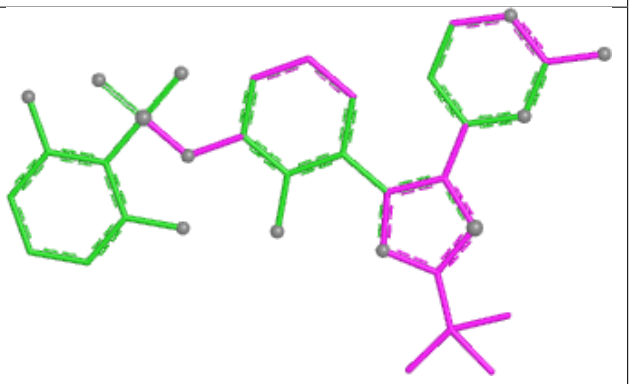


Rings

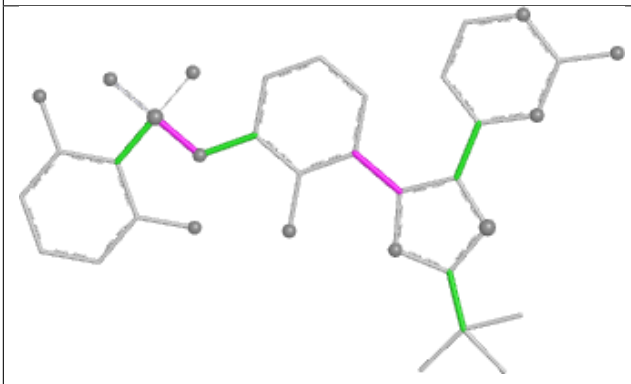
Ligand P06 A 601



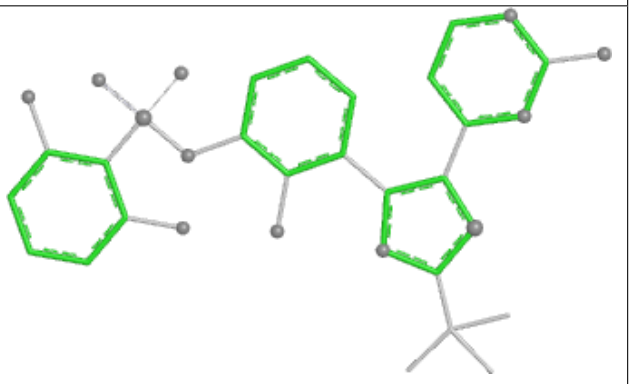
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

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	248/283 (87%)	0.91	31 (12%)	8	6	76, 110, 155, 199	0
1	B	248/283 (87%)	0.87	33 (13%)	7	6	75, 109, 154, 185	0
1	C	248/283 (87%)	0.92	30 (12%)	8	7	75, 109, 158, 198	0
1	D	248/283 (87%)	0.81	30 (12%)	8	7	74, 109, 159, 193	0
All	All	992/1132 (87%)	0.88	124 (12%)	8	6	74, 109, 158, 199	0

All (124) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	372	GLY	5.9
1	A	270	ILE	5.8
1	A	322	HIS	4.7
1	B	466	GLY	4.6
1	B	538	VAL	4.6
1	C	322	HIS	4.6
1	A	385	LYS	4.1
1	C	501	GLY	4.0
1	B	539	TRP	4.0
1	B	423	VAL	3.9
1	A	386	LEU	3.9
1	C	330	PHE	3.8
1	B	270	ILE	3.7
1	C	519	LEU	3.6
1	A	420	ILE	3.6
1	C	278	PHE	3.6
1	C	415	LEU	3.5
1	B	385	LYS	3.5
1	B	386	LEU	3.4
1	C	359	THR	3.4
1	B	359	THR	3.3

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Mol	Chain	Res	Type	RSRZ
1	C	316	ASP	3.3
1	B	332	TYR	3.2
1	A	284	ALA	3.2
1	C	329	GLY	3.2
1	A	278	PHE	3.2
1	C	323	TYR	3.1
1	D	357	SER	3.0
1	C	288	ILE	3.0
1	C	485	CYS	3.0
1	C	507	PHE	3.0
1	D	489	PHE	3.0
1	B	523	PRO	3.0
1	D	515	LEU	2.9
1	D	498	LEU	2.9
1	A	357	SER	2.9
1	A	390	LEU	2.9
1	A	283	LYS	2.8
1	B	256	ALA	2.8
1	D	322	HIS	2.8
1	C	502	ILE	2.7
1	D	501	GLY	2.7
1	D	415	LEU	2.7
1	D	284	ALA	2.7
1	B	269	GLU	2.7
1	B	485	CYS	2.7
1	B	430	ILE	2.7
1	C	270	ILE	2.7
1	D	359	THR	2.7
1	C	504	SER	2.6
1	B	267	PHE	2.6
1	A	491	THR	2.6
1	B	336	THR	2.6
1	C	328	ASP	2.5
1	D	422	LEU	2.5
1	C	333	ASP	2.5
1	B	323	TYR	2.5
1	A	333	ASP	2.5
1	B	428	VAL	2.5
1	D	273	ILE	2.5
1	D	259	VAL	2.5
1	A	488	ALA	2.5
1	C	498	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	256	ALA	2.4
1	B	305	ALA	2.4
1	A	269	GLU	2.4
1	D	369	CYS	2.4
1	B	330	PHE	2.4
1	A	434	GLY	2.4
1	D	500	ASP	2.4
1	D	269	GLU	2.4
1	D	487	THR	2.3
1	D	363	PHE	2.3
1	B	294	VAL	2.3
1	B	389	VAL	2.3
1	B	521	LYS	2.3
1	A	324	ASN	2.3
1	D	526	ARG	2.3
1	A	427	GLN	2.3
1	A	430	ILE	2.3
1	B	272	LEU	2.3
1	B	309	VAL	2.3
1	C	361	CYS	2.3
1	B	284	ALA	2.3
1	D	532	ILE	2.3
1	D	281	VAL	2.3
1	D	382	ARG	2.3
1	C	293	TYR	2.2
1	A	387	ASP	2.2
1	B	292	THR	2.2
1	B	420	ILE	2.2
1	B	333	ASP	2.2
1	D	428	VAL	2.2
1	C	315	LEU	2.2
1	C	466	GLY	2.2
1	D	476	LEU	2.2
1	A	461	SER	2.2
1	B	322	HIS	2.1
1	C	420	ILE	2.1
1	D	495	PHE	2.1
1	A	428	VAL	2.1
1	A	383	GLY	2.1
1	A	472	TYR	2.1
1	A	421	PHE	2.1
1	B	327	TRP	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	313	ALA	2.1
1	B	306	GLU	2.1
1	C	523	PRO	2.1
1	D	256	ALA	2.1
1	C	274	GLY	2.1
1	D	383	GLY	2.1
1	A	359	THR	2.1
1	C	331	ASP	2.1
1	A	263	PHE	2.0
1	C	495	PHE	2.0
1	A	367	GLU	2.0
1	A	458	GLU	2.0
1	D	270	ILE	2.0
1	A	300	TYR	2.0
1	A	424	ASP	2.0
1	C	267	PHE	2.0
1	D	294	VAL	2.0
1	B	300	TYR	2.0
1	D	332	TYR	2.0

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 oligosaccharides in this entry.

6.4 Ligands (i)

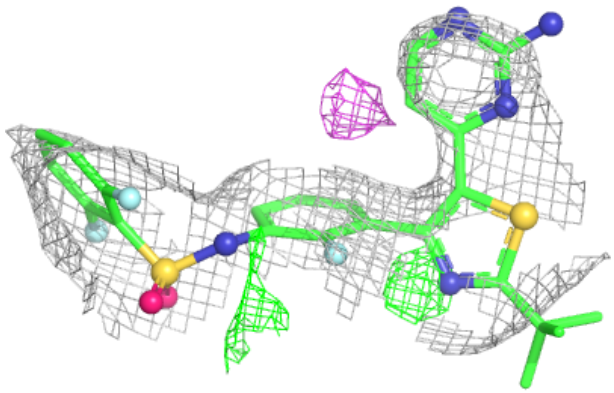
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

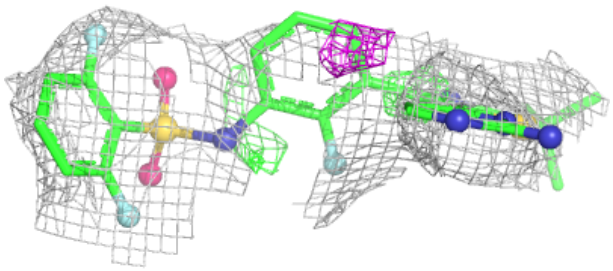
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	P06	A	601	35/35	0.96	0.10	73,88,94,97	0
2	P06	B	601	35/35	0.96	0.10	72,87,94,96	0
2	P06	D	601	35/35	0.96	0.11	73,87,93,95	0
2	P06	C	601	35/35	0.97	0.10	77,88,95,97	0

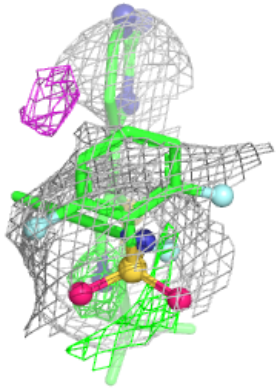
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around P06 A 601:

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

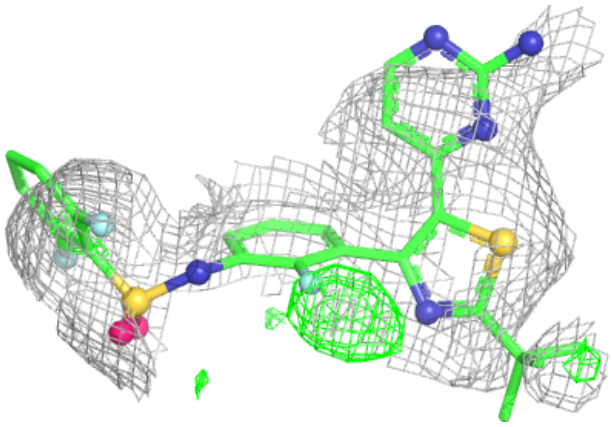


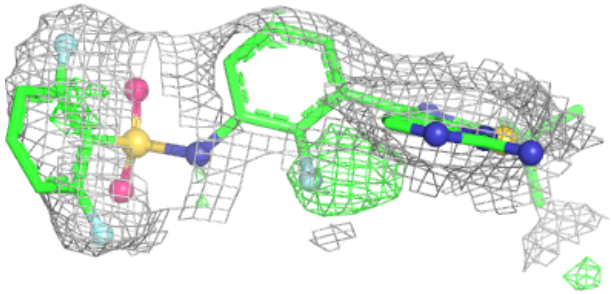


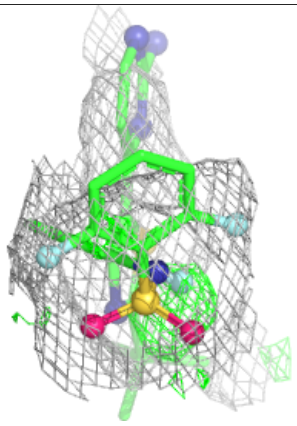


Electron density around P06 B 601:

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

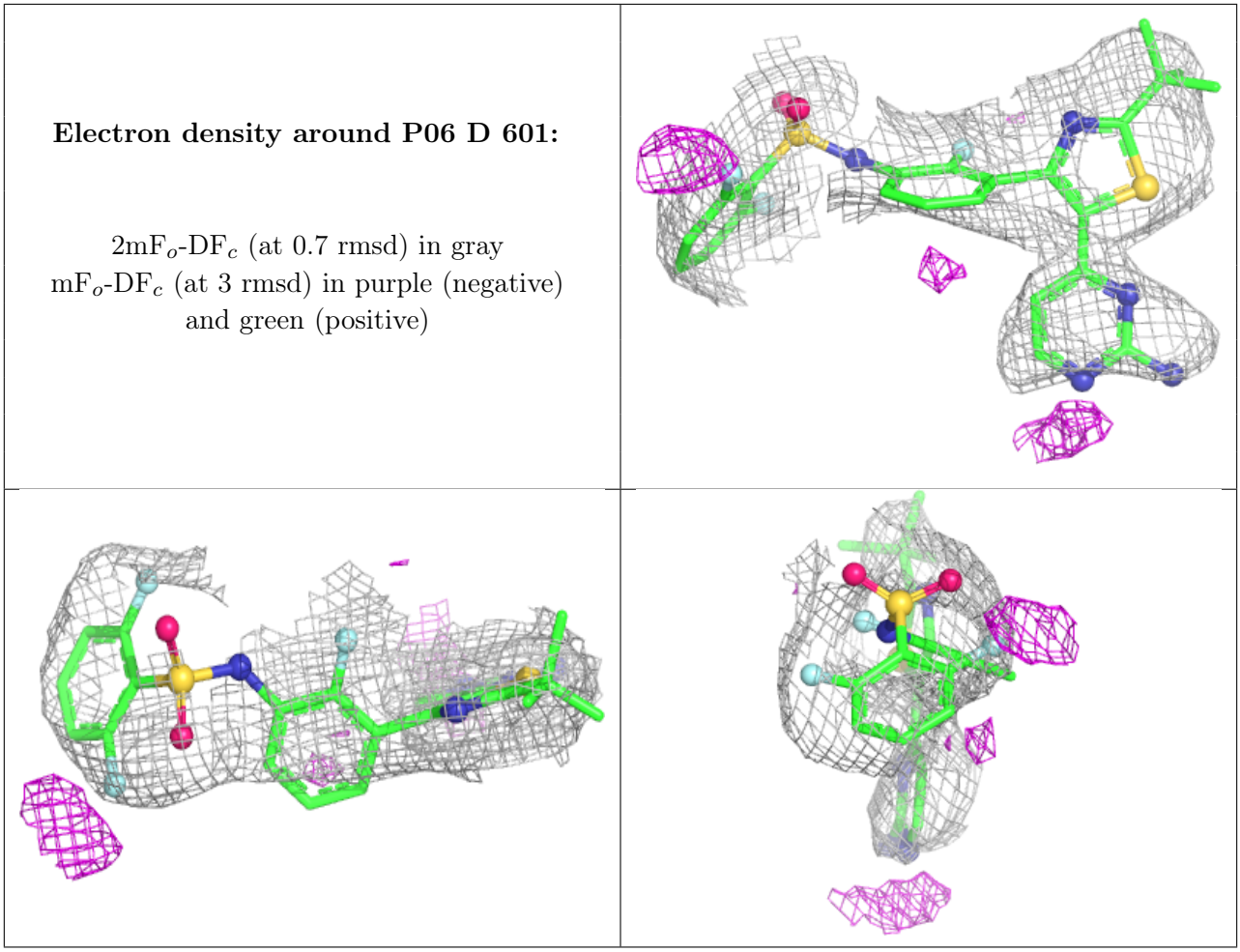






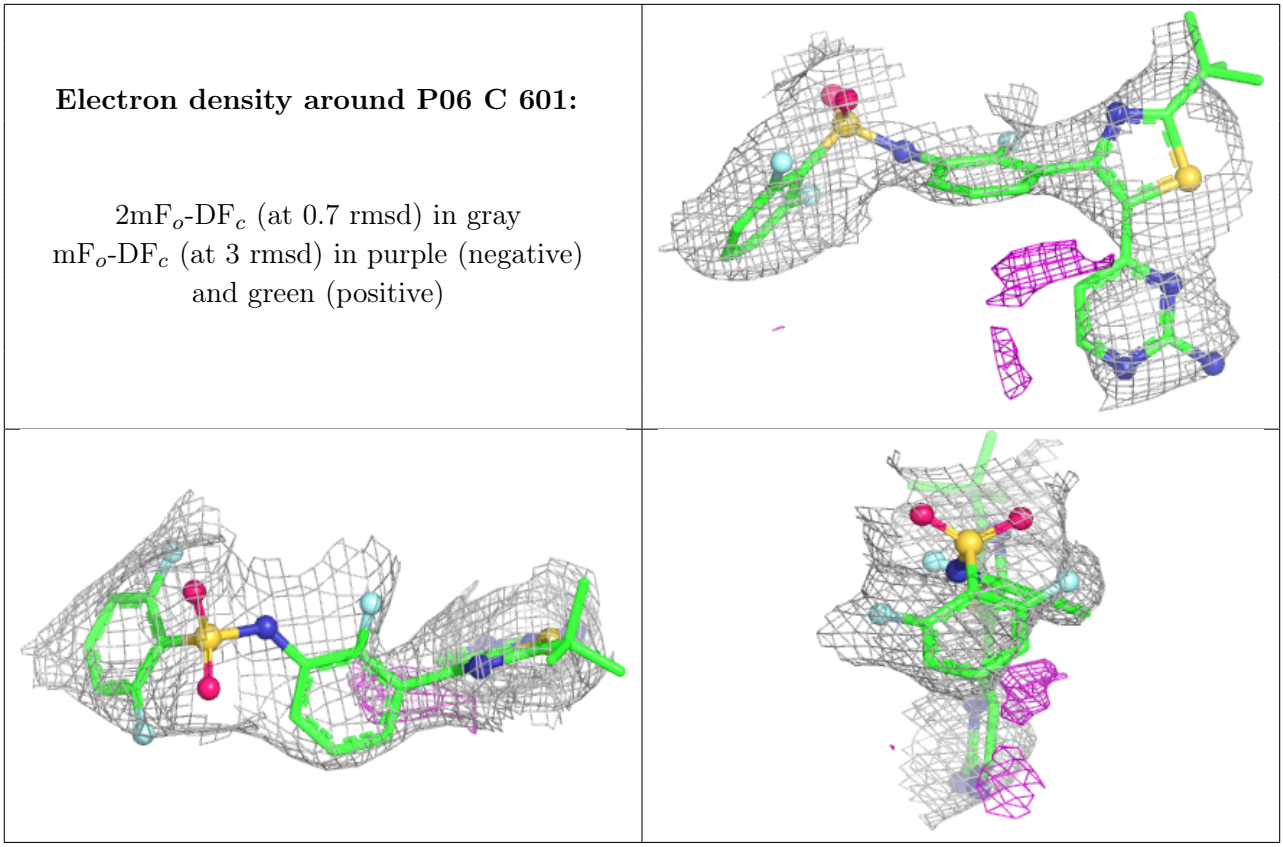
Electron density around P06 D 601:

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



Electron density around P06 C 601:

$2mF_o$-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.