W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

May 24, 2020 – 03:50 am BST

PDB ID	:	1CJ1
Title	:	GROWTH FACTOR RECEPTOR BINDING PROTEIN SH2 DOMAIN (HUMAN) COMPLEXED WITH A PHOSPHOTYROSYL DERIVATIVE
Authors	:	Rahuel, J.
Deposited on	:	1999-04-21
Resolution	:	3.00 Å(reported)

The following versions of software and data (see references (i)) were used in the production of this report:

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
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)	:	2.11

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.00 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.
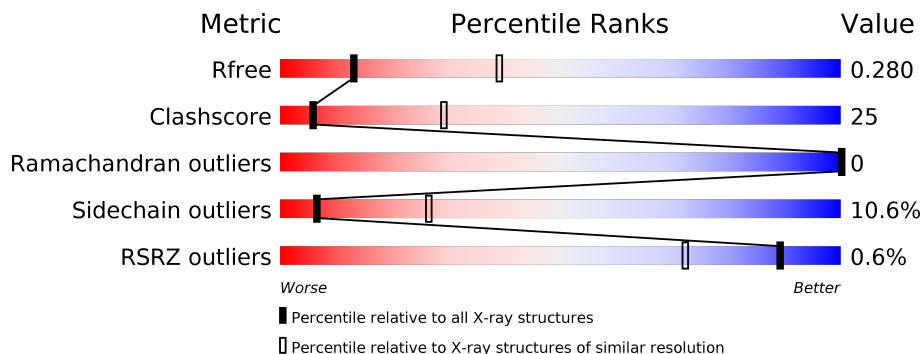
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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 on 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	96	50% 44% 6%
1	B	96	52% 42% 6%
1	C	96	50% 45% 5%
1	D	96	52% 43% 5%
1	E	96	51% 42% 7%
1	F	96	51% 43% 6%

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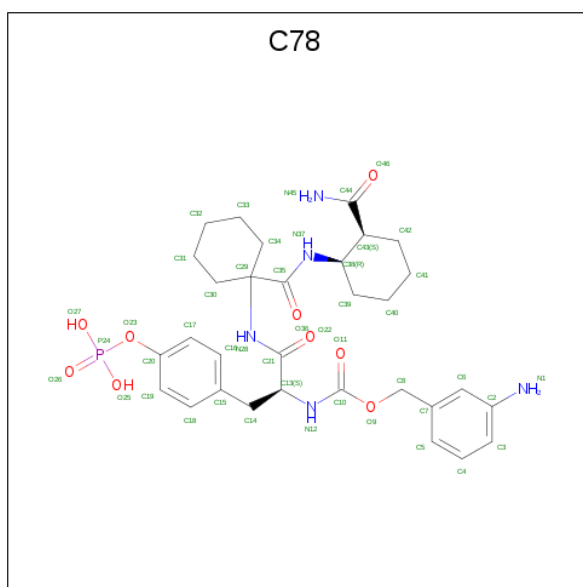| Mol	Chain	Length	Quality of chain
1	G	96	51% 43% 6%
1	H	96	2% 51% 43% 6%
1	I	96	2% 51% 44% 5%
1	J	96	50% 44% 6%
1	K	96	52% 42% 6%
1	L	96	2% 49% 45% 6%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 10060 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 PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	B	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	C	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	D	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	E	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	F	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	G	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	H	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	I	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	J	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	K	96	Total 792	C 509	N 142	O 140	S 1	0	0	0
1	L	96	Total 792	C 509	N 142	O 140	S 1	0	0	0

- Molecule 2 is [1-[1-(6-CARBAMOYL-CYCLOHEX-2-ENYLCARBAMOYL)-CYCLOHE XYLCARBAMOYL]-2-(4-PHOSPHONOOXY-PHENYL)- ETHYL]-CARBAMIC ACID 3-AMINOBENZYLESTER (three-letter code: C78) (formula: $C_{31}H_{42}N_5O_9P$).

C78

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	B	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	C	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	D	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	E	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	F	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	G	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	H	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	I	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	J	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	K	1	Total	C	N	O	P	0	0
			46	31	5	9	1		
2	L	1	Total	C	N	O	P	0	0
			46	31	5	9	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	4	Total 4	O 4	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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.
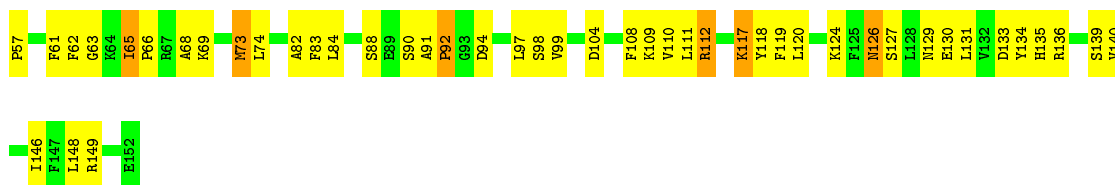
- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)
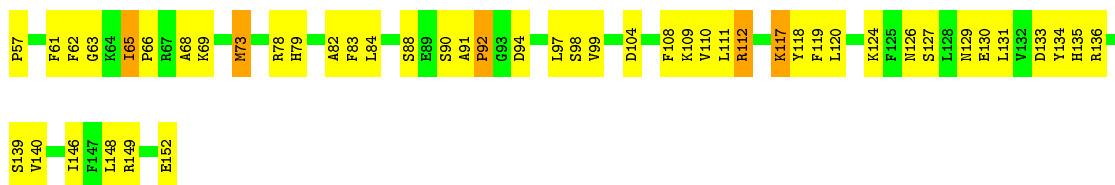
Chain A:
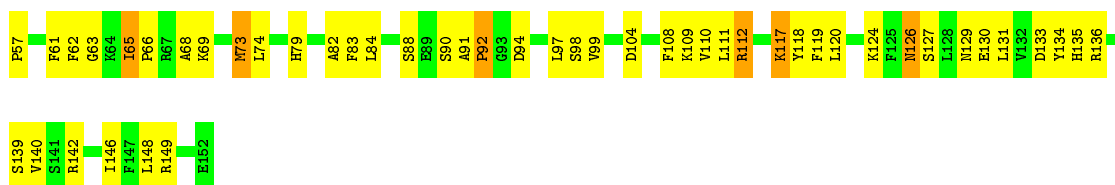
- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain B:

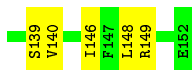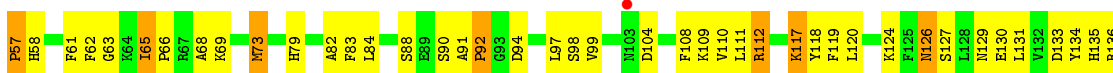- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain C:

- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)
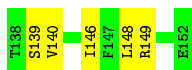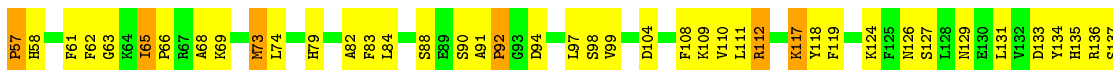
Chain D:

V140 S141 R142 I146 F147 L148 R149 E152

• Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

%

Chain E:

| 51% | 42% | 7% |

P57 H58 F61 F62 G63 K64 I65 P66 R67 A68 K69 M73 H79 A82 F83 L84 S88 E89 S90 A91 P92 G93 D94 L97 S98 V99 N103 D104 F108 K109 V110 L111 R112 K117 Y118 F119 L120 K124 F125 N126 S127 L128 N129 E130 L131 V132 D133 Y134 H135 R136

S139 V140 I146 F147 L148 R149 E152

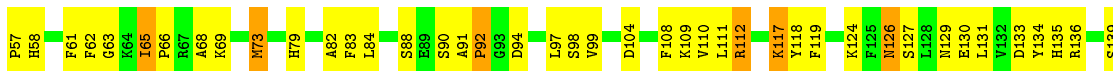• Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain F:

| 51% | 43% | 6% |

P57 H58 F61 F62 G63 K64 I65 P66 R67 A68 K69 M73 L74 H79 A82 F83 L84 S88 E89 S90 A91 P92 G93 D94 L97 S98 V99 D104 F108 K109 V110 L111 R112 K117 Y118 F119 K124 N126 S127 L128 N129 E130 L131 V132 D133 Y134 H135 R136 S137

T138 S139 V140 I146 F147 L148 R149 E152
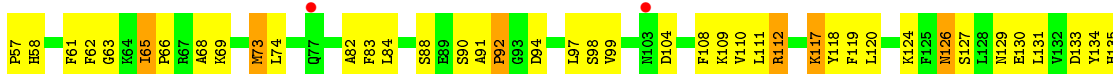
• Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain G:

| 51% | 43% | 6% |

P57 H58 F61 F62 G63 K64 I65 P66 R67 A68 K69 M73 H79 A82 F83 L84 S88 E89 S90 A91 P92 G93 D94 L97 S98 V99 D104 F108 K109 V110 L111 R112 K117 Y118 F119 K124 F125 N126 S127 L128 N129 E130 L131 V132 D133 Y134 H135 R136 S139

V140 S141 R142 I146 F147 L148 R149 E152

• Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

2%

Chain H:

| 51% | 43% | 6% |

P57 H58 F61 F62 G63 K64 I65 P66 R67 A68 K69 M73 L74 Q77 A82 F83 L84 S88 E89 S90 A91 P92 G93 D94 L97 S98 V99 N103 D104 F108 K109 V110 L111 R112 K117 Y118 F119 L120 K124 F125 N126 S127 L128 N129 E130 L131 V132 D133 Y134 H135

R136 S139 V140 I146 F147 L148 R149 E152

• Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)
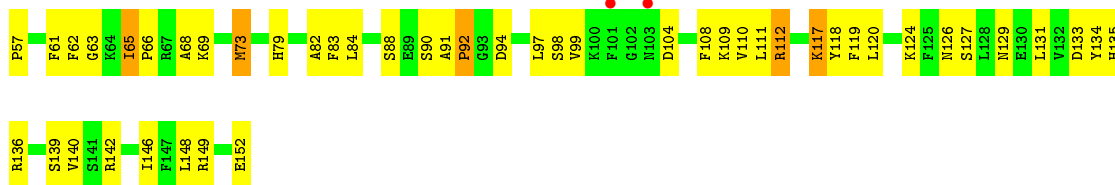
2%

Chain I:

| 51% | 44% | 5% |

- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain J:

- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

Chain K:

- Molecule 1: PROTEIN (GROWTH FACTOR RECEPTOR-BOUND PROTEIN 2)

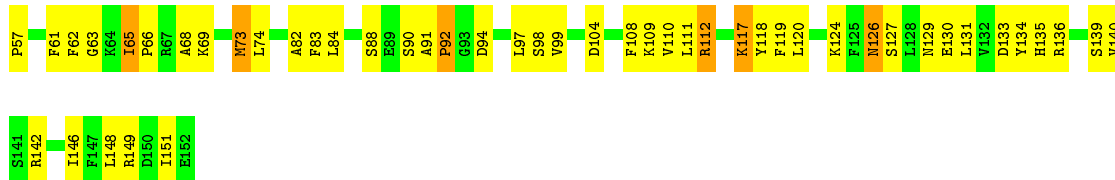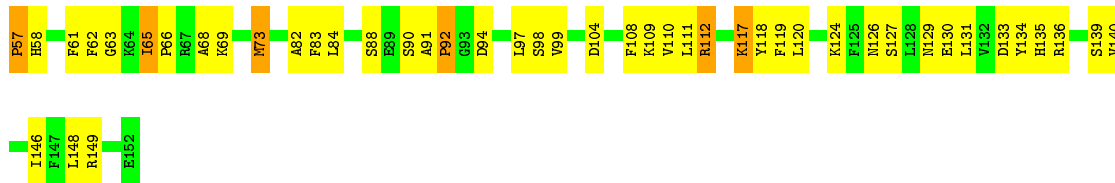Chain L:
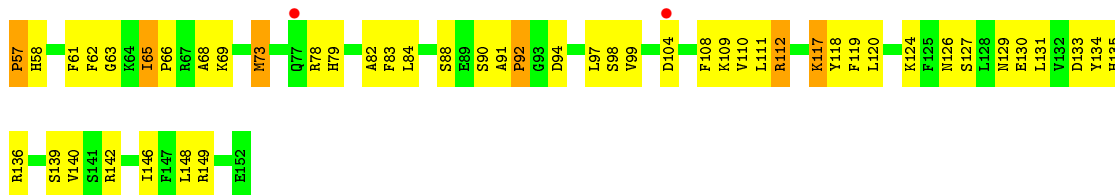
4   Data and refinement statistics   (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	73.80Å 93.30Å 232.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	31.00 – 3.00 30.05 – 3.00	Depositor EDS
% Data completeness (in resolution range)	91.8 (31.00-3.00) 90.0 (30.05-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	20.00	Depositor
$< I/\sigma(I) >$ [1]	2.31 (at 3.00Å)	Xtriage
Refinement program	X-PLOR 3.1F	Depositor
R, R_{free}	0.305 , 0.317 0.266 , 0.280	Depositor DCC
R_{free} test set	1534 reflections (4.81%)	wwPDB-VP
Wilson B-factor (Å^2)	32.4	Xtriage
Anisotropy	0.371	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 69.9	EDS
L-test for twinning[2]	$< |L| > = 0.47$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.85	EDS
Total number of atoms	10060	wwPDB-VP
Average B, all atoms (Å^2)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.53% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: C78

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	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	B	1.31	3/814 (0.4%)	1.24	3/1094 (0.3%)
1	C	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	D	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	E	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	F	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	G	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	H	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	I	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	J	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	K	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
1	L	1.31	3/814 (0.4%)	1.23	3/1094 (0.3%)
All	All	1.31	36/9768 (0.4%)	1.23	36/13128 (0.3%)

The worst 5 of 36 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	68	ALA	CA-CB	-6.17	1.39	1.52
1	E	68	ALA	CA-CB	-6.17	1.39	1.52
1	H	68	ALA	CA-CB	-6.17	1.39	1.52
1	K	68	ALA	CA-CB	-6.17	1.39	1.52
1	G	68	ALA	CA-CB	-6.16	1.39	1.52

The worst 5 of 36 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	57	PRO	N-CA-CB	7.40	112.19	103.30
1	B	57	PRO	N-CA-CB	7.39	112.17	103.30
1	G	57	PRO	N-CA-CB	7.39	112.17	103.30
1	F	57	PRO	N-CA-CB	7.39	112.17	103.30
1	D	57	PRO	N-CA-CB	7.39	112.16	103.30

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	792	0	772	46	0
1	B	792	0	772	45	0
1	C	792	0	772	41	2
1	D	792	0	772	39	0
1	E	792	0	772	50	1
1	F	792	0	772	46	1
1	G	792	0	772	44	0
1	H	792	0	772	47	0
1	I	792	0	772	38	1
1	J	792	0	772	43	0
1	K	792	0	772	41	0
1	L	792	0	772	47	1
2	A	46	0	40	0	0
2	B	46	0	40	0	0
2	C	46	0	40	0	0
2	D	46	0	40	0	0
2	E	46	0	40	0	0
2	F	46	0	40	0	0
2	G	46	0	40	0	0
2	H	46	0	40	0	0
2	I	46	0	40	0	0
2	J	46	0	40	0	0
2	K	46	0	40	0	0
2	L	46	0	40	0	0
3	A	4	0	0	0	0
All	All	10060	0	9744	497	3

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 25.

The worst 5 of 497 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:73:MET:CE	1:L:73:MET:SD	2.06	1.44
1:G:73:MET:CE	1:G:73:MET:SD	2.06	1.44
1:I:73:MET:SD	1:I:73:MET:CE	2.06	1.44
1:B:73:MET:SD	1:B:73:MET:CE	2.06	1.44
1:K:73:MET:SD	1:K:73:MET:CE	2.06	1.44

All (3) 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)
1:C:78:ARG:NH2	1:F:137:SER:O[4_566]	2.04	0.16
1:C:152:GLU:OE2	1:I:152:GLU:OE2[2_564]	2.07	0.13
1:E:126:ASN:OD1	1:L:78:ARG:NH2[2_565]	2.19	0.01

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	B	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	C	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	D	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	E	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	F	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	G	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	H	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	I	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	J	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
1	K	94/96 (98%)	88 (94%)	6 (6%)	0	100	100

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	L	94/96 (98%)	88 (94%)	6 (6%)	0	100	100
All	All	1128/1152 (98%)	1056 (94%)	72 (6%)	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	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	B	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	C	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	D	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	E	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	F	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	G	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	H	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	I	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	J	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	K	85/85 (100%)	76 (89%)	9 (11%)	6	26
1	L	85/85 (100%)	76 (89%)	9 (11%)	6	26
All	All	1020/1020 (100%)	912 (89%)	108 (11%)	6	26

5 of 108 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	109	LYS
1	G	126	ASN
1	L	65	ILE
1	F	117	LYS
1	G	65	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	58	HIS
1	F	58	HIS
1	K	58	HIS
1	L	58	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 carbohydrates in this entry.

5.6 Ligand geometry (i)

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	C78	A	155	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	H	162	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	G	161	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	11 (16%)
2	C78	L	166	-	49,49,49	2.11	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	B	156	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	F	160	-	49,49,49	2.11	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	K	165	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	11 (16%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	C78	D	158	-	49,49,49	2.11	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	E	159	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	11 (16%)
2	C78	J	164	-	49,49,49	2.12	13 (26%)	68,69,69	1.97	10 (14%)
2	C78	I	163	-	49,49,49	2.11	13 (26%)	68,69,69	1.96	10 (14%)
2	C78	C	157	-	49,49,49	2.12	13 (26%)	68,69,69	1.96	10 (14%)

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	C78	A	155	-	-	3/41/62/62	0/4/4/4
2	C78	H	162	-	-	3/41/62/62	0/4/4/4
2	C78	G	161	-	-	3/41/62/62	0/4/4/4
2	C78	L	166	-	-	3/41/62/62	0/4/4/4
2	C78	B	156	-	-	3/41/62/62	0/4/4/4
2	C78	F	160	-	-	3/41/62/62	0/4/4/4
2	C78	K	165	-	-	3/41/62/62	0/4/4/4
2	C78	D	158	-	-	3/41/62/62	0/4/4/4
2	C78	E	159	-	-	3/41/62/62	0/4/4/4
2	C78	J	164	-	-	3/41/62/62	0/4/4/4
2	C78	I	163	-	-	3/41/62/62	0/4/4/4
2	C78	C	157	-	-	3/41/62/62	0/4/4/4

The worst 5 of 156 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	156	C78	C40-C39	-7.08	1.34	1.53
2	G	161	C78	C40-C39	-7.06	1.34	1.53
2	L	166	C78	C40-C39	-7.05	1.34	1.53
2	J	164	C78	C40-C39	-7.05	1.34	1.53
2	K	165	C78	C40-C39	-7.05	1.34	1.53

The worst 5 of 123 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	156	C78	C41-C40-C39	6.42	124.50	111.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	K	165	C78	C41-C40-C39	6.42	124.50	111.42
2	H	162	C78	C41-C40-C39	6.41	124.48	111.42
2	L	166	C78	C41-C40-C39	6.41	124.48	111.42
2	F	160	C78	C41-C40-C39	6.40	124.47	111.42

There are no chirality outliers.

5 of 36 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	155	C78	C38-C43-C44-O46
2	C	157	C78	C38-C43-C44-O46
2	L	166	C78	C38-C43-C44-O46
2	G	161	C78	C38-C43-C44-O46
2	H	162	C78	C38-C43-C44-O46

There are no ring outliers.

No monomer is involved in short contacts.

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 C78 A 155

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 H 162

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 G 161

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 L 166

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 B 156

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 F 160

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 K 165

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 D 158

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 E 159

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 J 164

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 I 163

Bond lengths

Bond angles

Torsions

Rings

Ligand C78 C 157

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 (i)

6.1 Protein, DNA and RNA chains (i)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	96/96 (100%)	-0.45	0	100	100	2, 20, 60, 105	0
1	B	96/96 (100%)	-0.42	0	100	100	2, 20, 60, 105	0
1	C	96/96 (100%)	-0.48	0	100	100	2, 20, 60, 105	0
1	D	96/96 (100%)	-0.52	0	100	100	2, 20, 60, 105	0
1	E	96/96 (100%)	-0.33	1 (1%)	82	59	2, 20, 60, 105	0
1	F	96/96 (100%)	-0.43	0	100	100	2, 20, 60, 105	0
1	G	96/96 (100%)	-0.40	0	100	100	2, 20, 60, 105	0
1	H	96/96 (100%)	-0.29	2 (2%)	63	34	2, 20, 60, 105	0
1	I	96/96 (100%)	0.10	2 (2%)	63	34	2, 20, 60, 105	0
1	J	96/96 (100%)	-0.39	0	100	100	2, 20, 60, 105	0
1	K	96/96 (100%)	-0.20	0	100	100	2, 20, 60, 105	0
1	L	96/96 (100%)	0.28	2 (2%)	63	34	2, 20, 60, 105	0
All	All	1152/1152 (100%)	-0.29	7 (0%)	89	72	2, 20, 64, 105	0

The worst 5 of 7 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	103	ASN	3.8
1	L	77	GLN	3.0
1	I	101	PHE	2.8
1	H	103	ASN	2.1
1	E	103	ASN	2.1

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 carbohydrates 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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\mathring{A}^2$)	Q<0.9
2	C78	E	159	46/46	0.90	0.22	2,13,50,50	0
2	C78	L	166	46/46	0.92	0.18	2,13,50,50	0
2	C78	K	165	46/46	0.93	0.18	2,13,50,50	0
2	C78	I	163	46/46	0.93	0.19	2,13,50,50	0
2	C78	H	162	46/46	0.94	0.17	2,13,50,50	0
2	C78	G	161	46/46	0.94	0.16	2,13,50,50	0
2	C78	D	158	46/46	0.95	0.18	2,13,50,50	0
2	C78	A	155	46/46	0.95	0.18	2,13,50,50	0
2	C78	J	164	46/46	0.95	0.14	2,13,50,50	0
2	C78	C	157	46/46	0.95	0.19	2,13,50,50	0
2	C78	F	160	46/46	0.96	0.17	2,13,50,50	0
2	C78	B	156	46/46	0.96	0.17	2,13,50,50	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 C78 E 159:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
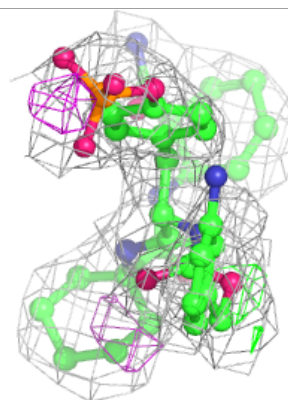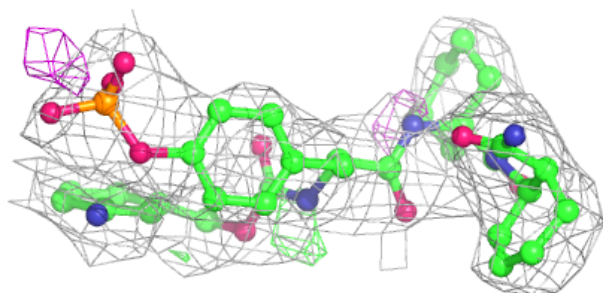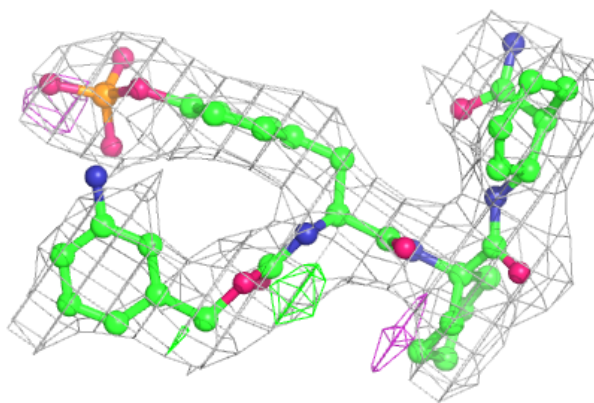
Electron density around C78 L 166:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
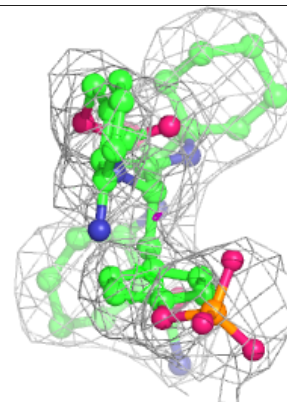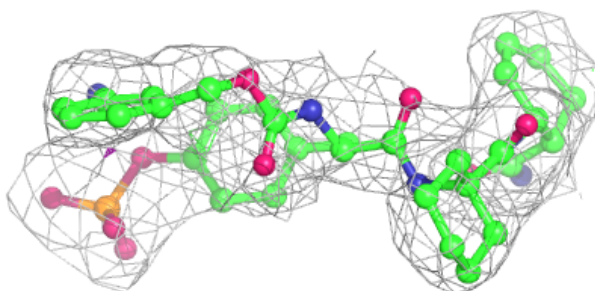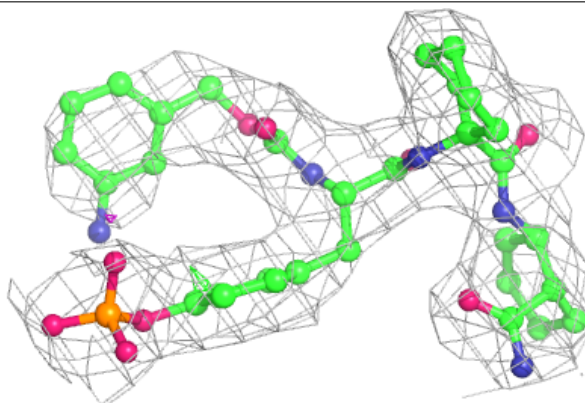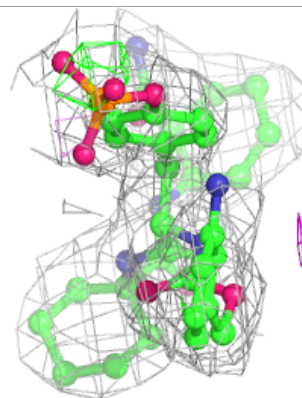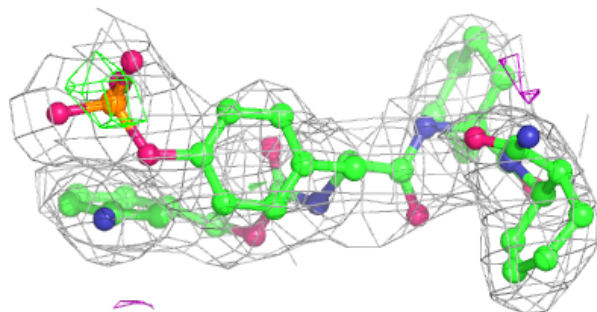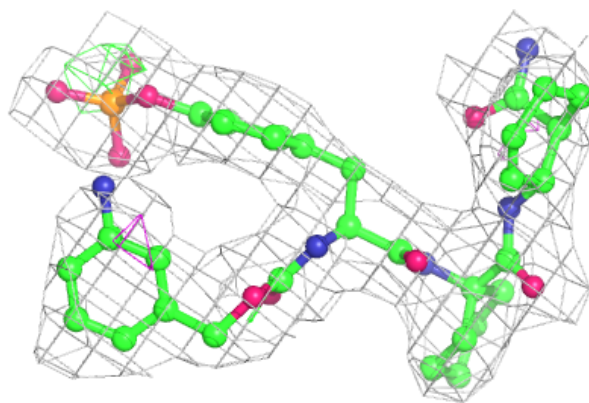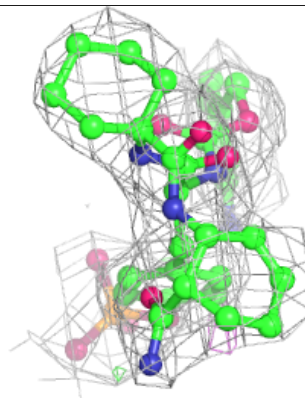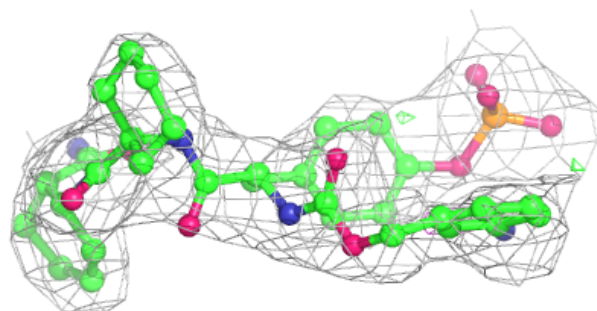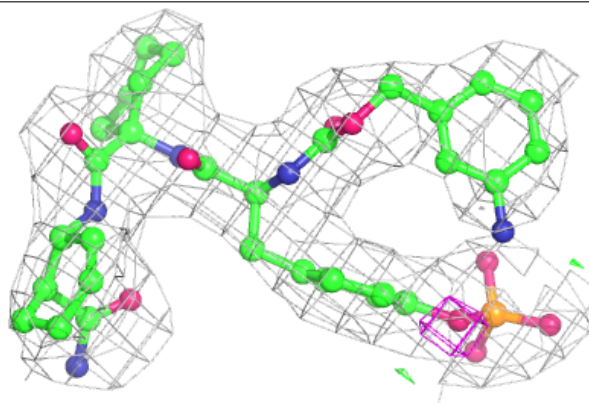$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
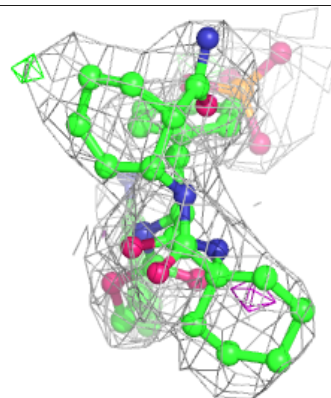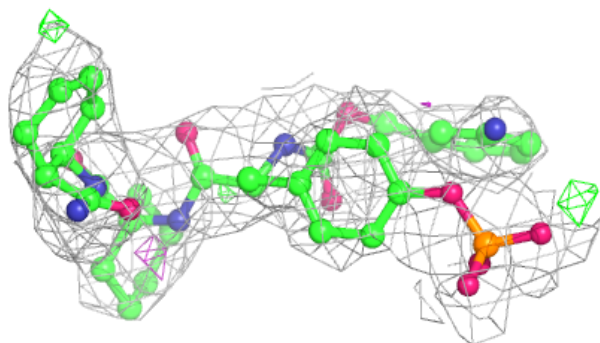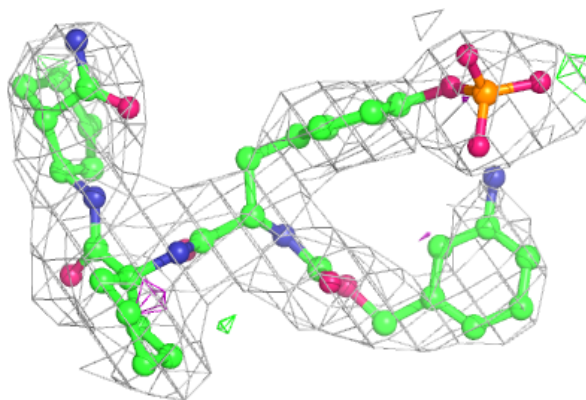
Electron density around C78 K 165:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
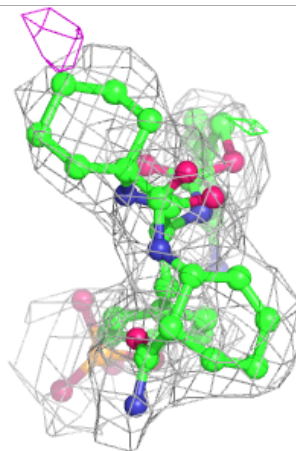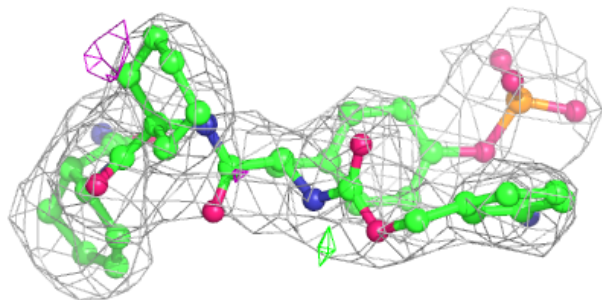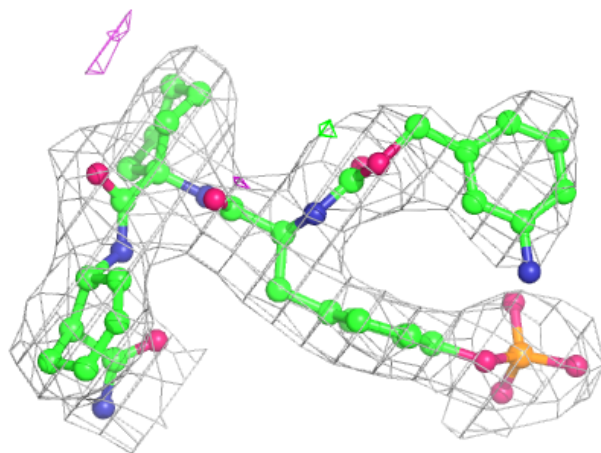
Electron density around C78 I 163:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
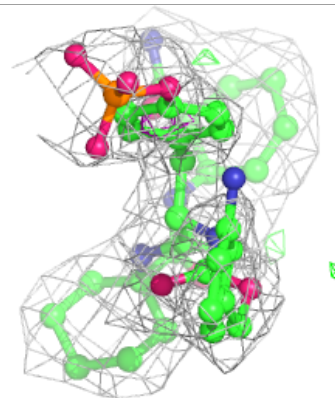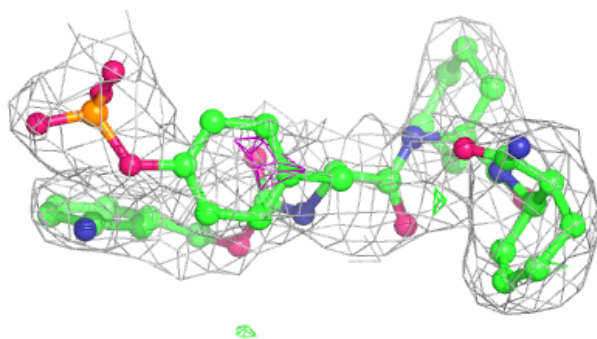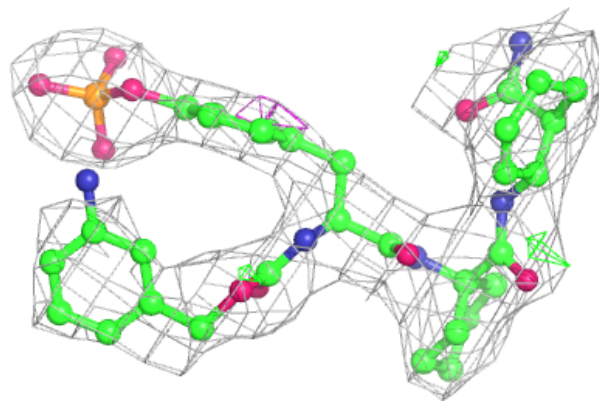
Electron density around C78 H 162:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
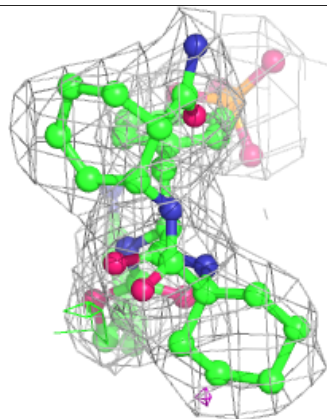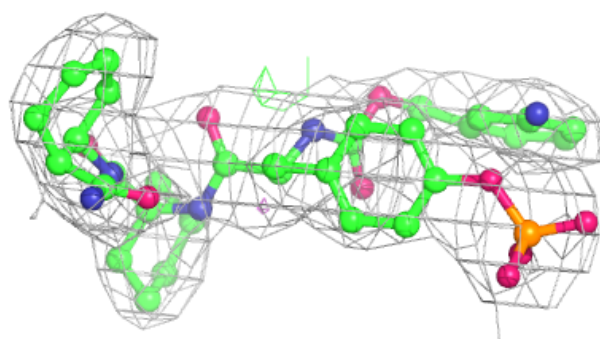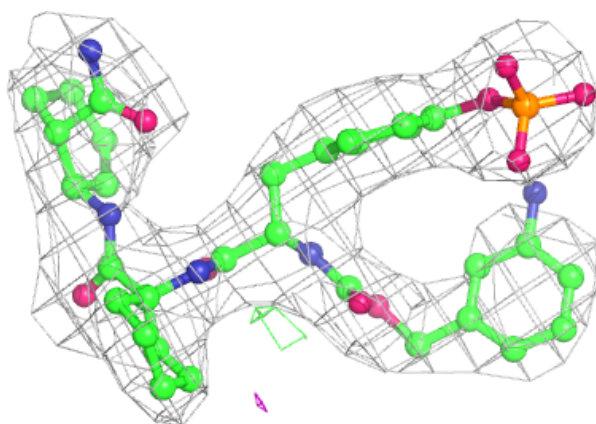$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
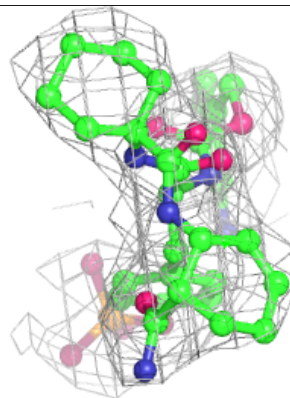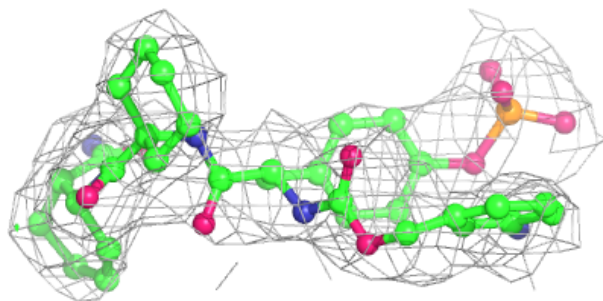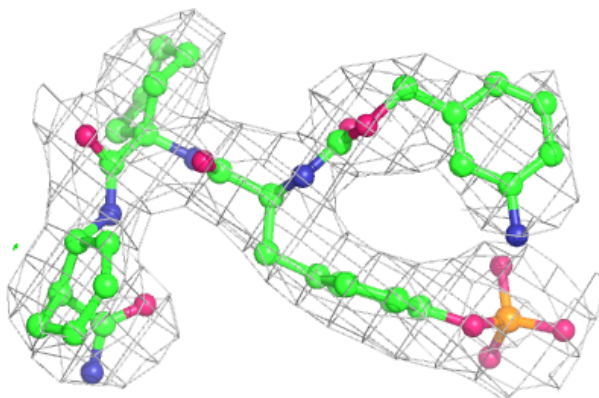
Electron density around C78 G 161:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
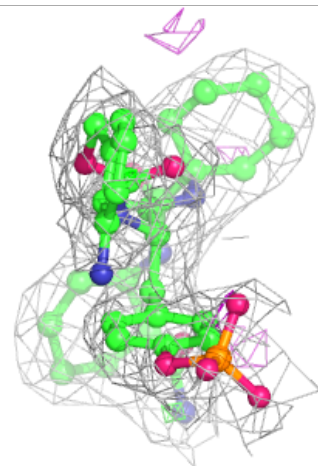mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
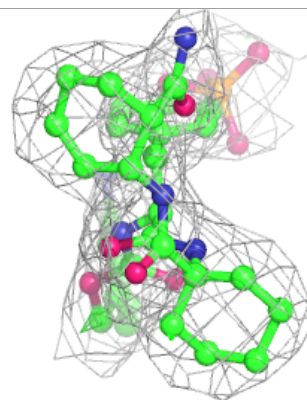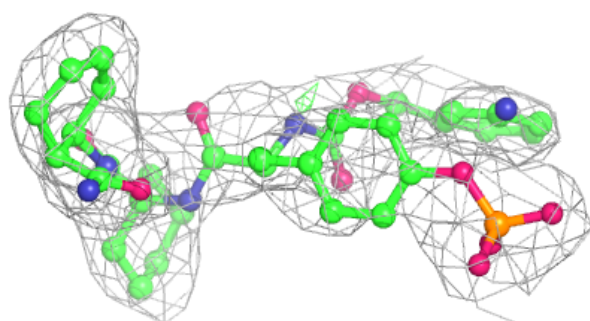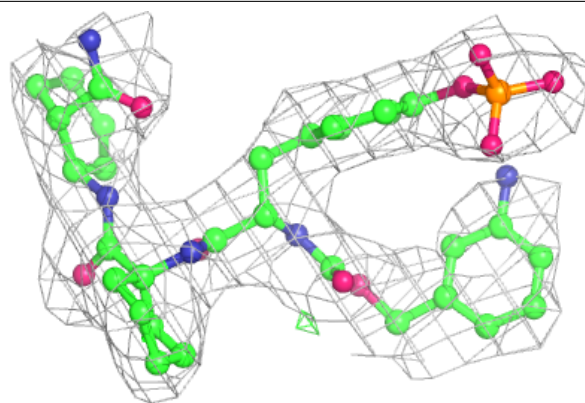
Electron density around C78 D 158:

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

Electron density around C78 A 155:

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

Electron density around C78 J 164:

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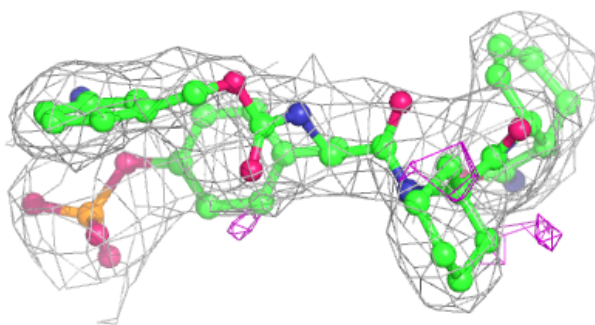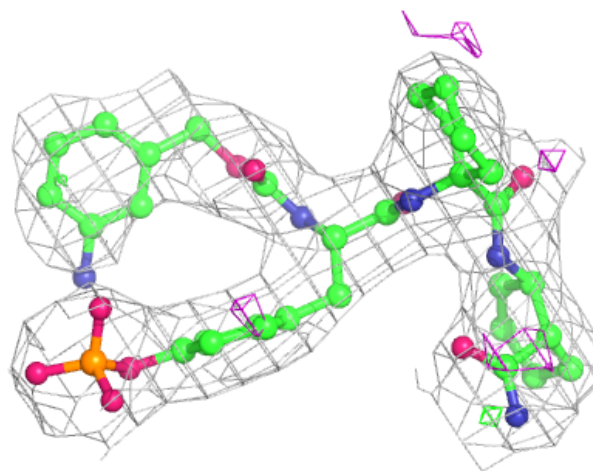$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around C78 C 157:

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

Electron density around C78 F 160:

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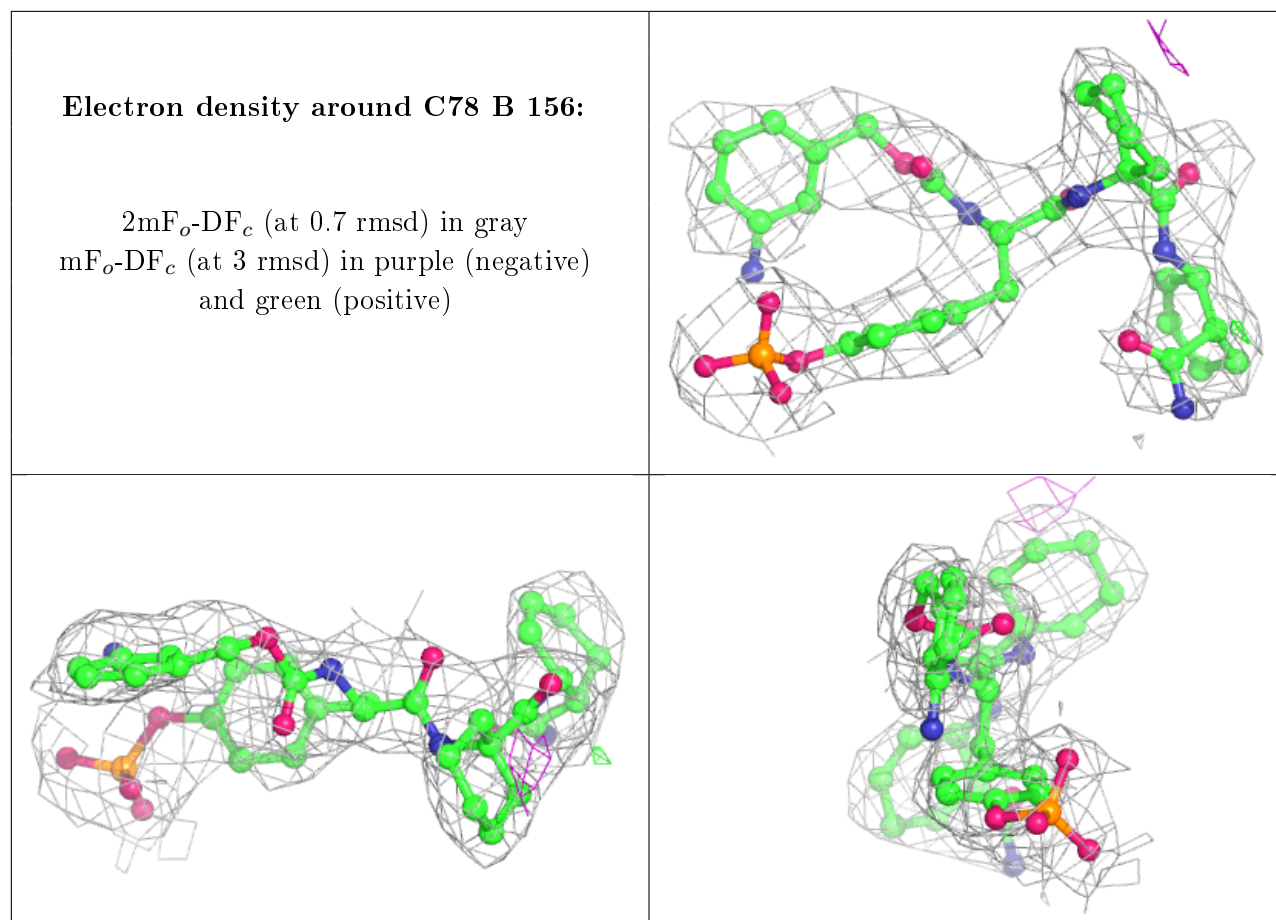and green (positive)

Electron density around C78 B 156:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.