



wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 23, 2026 – 06:57 AM EDT

PDB ID : 3N1S / pdb_00003n1s
Title : Crystal structure of wild type ecHint GMP complex
Authors : Cody, V.
Deposited on : 2010-05-17
Resolution : 1.45 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

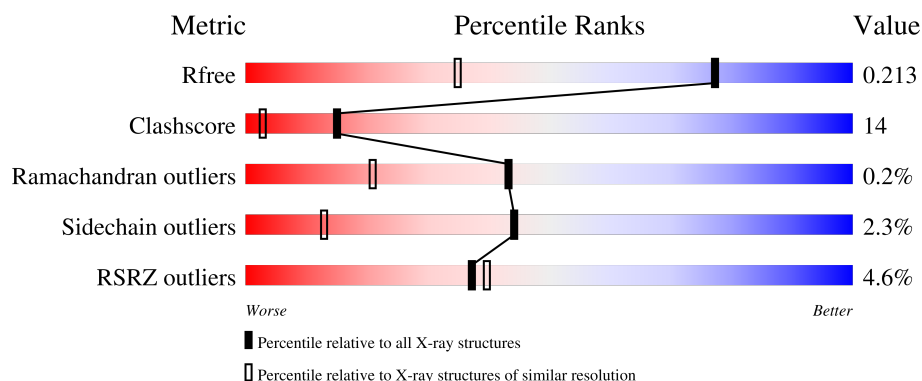
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.45 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	1756 (1.46-1.46)
Clashscore	190562	1795 (1.46-1.46)
Ramachandran outliers	187476	1776 (1.46-1.46)
Sidechain outliers	187428	1776 (1.46-1.46)
RSRZ outliers	180081	1756 (1.46-1.46)

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

Mol	Chain	Length	Quality of chain
1	A	119	5% 76% 20% ..
1	B	119	3% 87% 11% ..
1	E	119	3% 81% 16% .
1	F	119	7% 81% 16% ...
1	I	119	3% 79% 16% ..

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Mol	Chain	Length	Quality of chain
1	J	119	
1	M	119	
1	N	119	

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
3	EDO	B	125	-	-	X	-

2 Entry composition

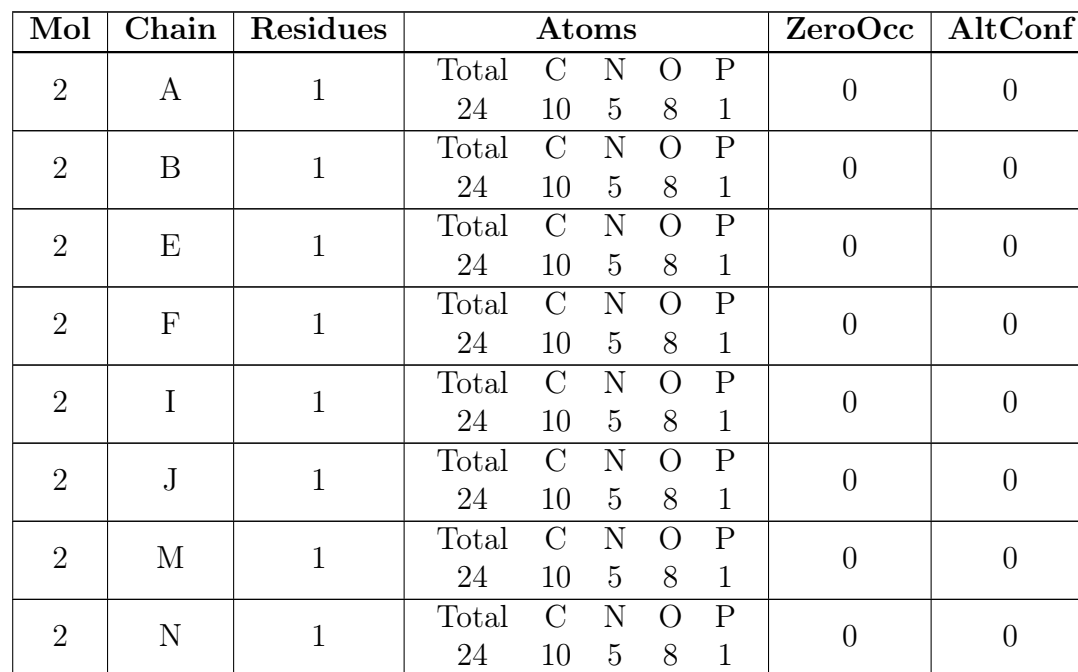
There are 4 unique types of molecules in this entry. The entry contains 9054 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 HIT-like protein hinT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	117	Total	C	N	O	S	0	8	0
			977	619	177	173	8			
1	B	118	Total	C	N	O	S	6	7	0
			972	615	174	177	6			
1	E	115	Total	C	N	O	S	4	6	0
			934	591	163	174	6			
1	F	118	Total	C	N	O	S	0	9	0
			988	627	178	178	5			
1	I	114	Total	C	N	O	S	0	7	0
			931	590	164	171	6			
1	J	119	Total	C	N	O	S	0	10	0
			983	628	168	180	7			
1	M	115	Total	C	N	O	S	0	9	0
			951	605	168	172	6			
1	N	115	Total	C	N	O	S	0	11	0
			958	610	168	173	7			

- Molecule 2 is GUANOSINE-5'-MONOPHOSPHATE (CCD ID: 5GP) (formula: C₁₀H₁₄N₅O₈P).



- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: $\text{C}_2\text{H}_6\text{O}_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	B	1	Total	C	O	0	0
			4	2	2		
3	E	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		
3	I	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	I	1	Total	C	O	0	0
			4	2	2		
3	J	1	Total	C	O	0	0
			4	2	2		
3	J	1	Total	C	O	0	0
			4	2	2		
3	M	1	Total	C	O	0	0
			4	2	2		
3	M	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		
3	N	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	120	Total	O	0	0
			120	120		
4	B	145	Total	O	0	0
			145	145		
4	E	129	Total	O	0	0
			129	129		
4	F	116	Total	O	0	0
			116	116		
4	I	130	Total	O	0	0
			130	130		
4	J	134	Total	O	0	0
			134	134		
4	M	150	Total	O	0	0
			150	150		
4	N	144	Total	O	0	0
			144	144		

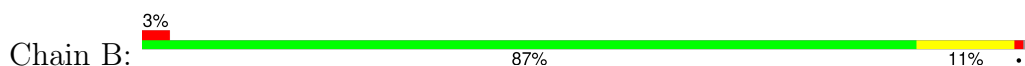
3 Residue-property plots [i](#)

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.

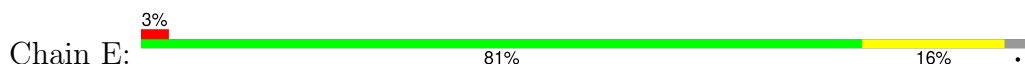
- Molecule 1: HIT-like protein hinT



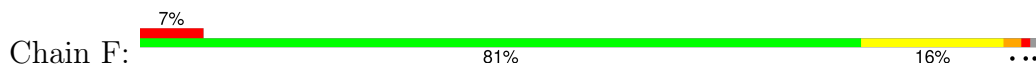
- Molecule 1: HIT-like protein hinT



- Molecule 1: HIT-like protein hinT



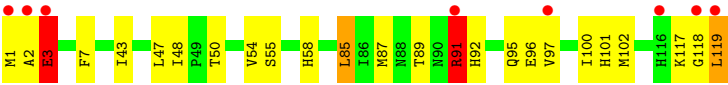
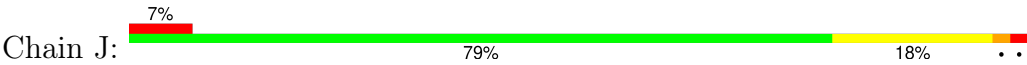
- Molecule 1: HIT-like protein hinT



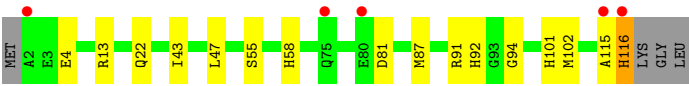
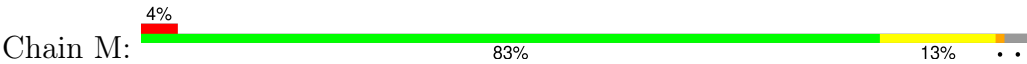
- Molecule 1: HIT-like protein hinT



- Molecule 1: HIT-like protein hinT



● Molecule 1: HIT-like protein hinT



● Molecule 1: HIT-like protein hinT



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	75.18Å 65.30Å 99.12Å 90.00° 109.75° 90.00°	Depositor
Resolution (Å)	37.96 – 1.45 37.96 – 1.45	Depositor EDS
% Data completeness (in resolution range)	98.8 (37.96-1.45) 98.8 (37.96-1.45)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	0.12	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.35 (at 1.45Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.177 , 0.209 0.181 , 0.213	Depositor DCC
R_{free} test set	8082 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	16.0	Xtriage
Anisotropy	0.094	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.010 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	9054	wwPDB-VP
Average B, all atoms (Å ²)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.02 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.3779e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, 5GP

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	0.58	0/1007	0.82	0/1362
1	B	0.60	0/996	0.75	0/1351
1	E	0.59	1/960 (0.1%)	0.74	1/1302 (0.1%)
1	F	0.55	0/1015	0.78	1/1375 (0.1%)
1	I	0.69	3/967 (0.3%)	0.78	1/1311 (0.1%)
1	J	0.60	0/1025	0.80	1/1390 (0.1%)
1	M	0.60	0/988	0.74	0/1341
1	N	0.59	0/1006	0.78	0/1364
All	All	0.60	4/7964 (0.1%)	0.77	4/10796 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	F	0	1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	91	ARG	CB-CG	-6.28	1.33	1.52
1	I	74[A]	GLU	C-O	-5.35	1.18	1.24
1	I	74[B]	GLU	C-O	-5.35	1.18	1.24
1	I	73	ALA	C-O	-5.32	1.17	1.24

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	J	91	ARG	N-CA-C	6.56	120.28	112.93

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	5	THR	N-CA-CB	-6.02	101.72	110.70
1	E	91	ARG	CA-CB-CG	5.82	125.74	114.10
1	F	91	ARG	N-CA-C	5.74	120.12	113.18

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	115	ALA	Peptide

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	977	0	1011	27	0
1	B	972	0	989	18	0
1	E	934	0	951	18	0
1	F	988	0	1012	32	0
1	I	931	0	944	20	0
1	J	983	0	1018	46	0
1	M	951	0	976	17	0
1	N	958	0	995	52	0
2	A	24	0	12	0	0
2	B	24	0	12	0	0
2	E	24	0	12	0	0
2	F	24	0	12	0	0
2	I	24	0	12	0	0
2	J	24	0	12	3	0
2	M	24	0	12	0	0
2	N	24	0	12	0	0
3	A	12	0	18	4	0
3	B	24	0	36	5	0
3	E	4	0	6	0	0
3	F	4	0	6	0	0
3	I	16	0	24	0	0
3	J	8	0	12	0	0
3	M	8	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	N	24	0	36	1	0
4	A	120	0	0	3	0
4	B	145	0	0	2	0
4	E	129	0	0	1	0
4	F	116	0	0	3	0
4	I	130	0	0	4	0
4	J	134	0	0	5	0
4	M	150	0	0	4	0
4	N	144	0	0	8	0
All	All	9054	0	8142	221	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 14.

The worst 5 of 221 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:F:90:ASN:CB	1:F:91:ARG:HH21	1.31	1.42
1:F:90:ASN:HB3	1:F:91:ARG:NH2	1.48	1.27
1:N:87[B]:MET:HE3	1:N:102[B]:MET:CG	1.64	1.26
1:J:2:ALA:HA	1:J:3:GLU:CB	1.72	1.16
1:J:2:ALA:CA	1:J:3:GLU:HB2	1.76	1.15

There are no symmetry-related clashes.

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	123/119 (103%)	119 (97%)	4 (3%)	0	100	100
1	B	123/119 (103%)	119 (97%)	3 (2%)	1 (1%)	16	3

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	119/119 (100%)	116 (98%)	3 (2%)	0	100	100
1	F	124/119 (104%)	121 (98%)	3 (2%)	0	100	100
1	I	117/119 (98%)	115 (98%)	2 (2%)	0	100	100
1	J	127/119 (107%)	124 (98%)	2 (2%)	1 (1%)	16	3
1	M	122/119 (102%)	120 (98%)	2 (2%)	0	100	100
1	N	124/119 (104%)	121 (98%)	3 (2%)	0	100	100
All	All	979/952 (103%)	955 (98%)	22 (2%)	2 (0%)	43	21

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	J	3	GLU
1	B	91	ARG

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	107/100 (107%)	104 (97%)	3 (3%)	38	8
1	B	106/100 (106%)	105 (99%)	1 (1%)	70	46
1	E	103/100 (103%)	100 (97%)	3 (3%)	37	7
1	F	108/100 (108%)	103 (95%)	5 (5%)	24	2
1	I	103/100 (103%)	102 (99%)	1 (1%)	68	42
1	J	110/100 (110%)	105 (96%)	5 (4%)	24	2
1	M	105/100 (105%)	103 (98%)	2 (2%)	50	17
1	N	108/100 (108%)	106 (98%)	2 (2%)	50	17
All	All	850/800 (106%)	828 (97%)	22 (3%)	44	10

5 of 22 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	J	85[A]	LEU
1	J	119	LEU
1	J	91	ARG
1	M	91	ARG
1	E	74	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 39 such sidechains are listed below:

Mol	Chain	Res	Type
1	J	75	GLN
1	N	22	GLN
1	J	90	ASN
1	M	58	HIS
1	N	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

33 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
3	EDO	B	123	-	3,3,3	0.40	0	2,2,2	0.44	0
3	EDO	N	123	-	3,3,3	0.40	0	2,2,2	0.24	0
3	EDO	M	121	-	3,3,3	0.44	0	2,2,2	0.53	0
3	EDO	B	121	-	3,3,3	0.46	0	2,2,2	0.37	0
2	5GP	I	205	-	26,26,26	1.00	1 (3%)	39,40,40	1.56	5 (12%)
3	EDO	B	124	-	3,3,3	0.40	0	2,2,2	0.42	0
3	EDO	I	120	-	3,3,3	0.35	0	2,2,2	0.37	0
3	EDO	B	122	-	3,3,3	0.42	0	2,2,2	0.55	0
2	5GP	J	204	-	26,26,26	0.94	1 (3%)	39,40,40	1.65	7 (17%)
3	EDO	N	124	-	3,3,3	0.52	0	2,2,2	0.34	0
3	EDO	I	123	-	3,3,3	0.46	0	2,2,2	0.48	0
3	EDO	N	120	-	3,3,3	0.45	0	2,2,2	0.22	0
2	5GP	E	203	-	26,26,26	1.02	1 (3%)	39,40,40	1.68	9 (23%)
3	EDO	I	121	-	3,3,3	0.49	0	2,2,2	0.53	0
3	EDO	F	120	-	3,3,3	0.52	0	2,2,2	0.51	0
3	EDO	E	120	-	3,3,3	0.40	0	2,2,2	0.51	0
3	EDO	I	122	-	3,3,3	0.53	0	2,2,2	0.57	0
3	EDO	B	120	-	3,3,3	0.43	0	2,2,2	0.17	0
3	EDO	M	120	-	3,3,3	0.49	0	2,2,2	0.51	0
2	5GP	N	206	-	26,26,26	1.02	2 (7%)	39,40,40	1.64	9 (23%)
2	5GP	F	202	-	26,26,26	0.91	0	39,40,40	1.78	9 (23%)
3	EDO	A	120	-	3,3,3	0.34	0	2,2,2	0.60	0
3	EDO	J	120	-	3,3,3	0.55	0	2,2,2	0.18	0
3	EDO	N	122	-	3,3,3	0.50	0	2,2,2	0.28	0
3	EDO	N	121	-	3,3,3	0.58	0	2,2,2	0.12	0
2	5GP	M	207	-	26,26,26	0.98	1 (3%)	39,40,40	1.53	6 (15%)
3	EDO	A	121	-	3,3,3	0.33	0	2,2,2	0.45	0
3	EDO	J	121	-	3,3,3	0.50	0	2,2,2	0.38	0
3	EDO	B	125	-	3,3,3	0.38	0	2,2,2	0.37	0
3	EDO	N	125	-	3,3,3	0.54	0	2,2,2	0.30	0
2	5GP	A	201	-	26,26,26	1.01	1 (3%)	39,40,40	1.74	8 (20%)
2	5GP	B	200	-	26,26,26	0.99	1 (3%)	39,40,40	1.53	6 (15%)
3	EDO	A	122	-	3,3,3	0.41	0	2,2,2	0.37	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
3	EDO	B	123	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	N	123	-	-	0/1/1/1	-
3	EDO	M	121	-	-	0/1/1/1	-
3	EDO	B	121	-	-	0/1/1/1	-
2	5GP	I	205	-	-	3/10/26/26	0/3/3/3
3	EDO	B	124	-	-	0/1/1/1	-
3	EDO	I	120	-	-	0/1/1/1	-
3	EDO	B	122	-	-	0/1/1/1	-
2	5GP	J	204	-	-	4/10/26/26	0/3/3/3
3	EDO	N	124	-	-	0/1/1/1	-
3	EDO	I	123	-	-	0/1/1/1	-
3	EDO	N	120	-	-	0/1/1/1	-
2	5GP	E	203	-	-	5/10/26/26	0/3/3/3
3	EDO	I	121	-	-	0/1/1/1	-
3	EDO	F	120	-	-	0/1/1/1	-
3	EDO	E	120	-	-	0/1/1/1	-
3	EDO	I	122	-	-	0/1/1/1	-
3	EDO	B	120	-	-	0/1/1/1	-
3	EDO	M	120	-	-	0/1/1/1	-
2	5GP	N	206	-	-	3/10/26/26	0/3/3/3
2	5GP	F	202	-	-	4/10/26/26	0/3/3/3
3	EDO	A	120	-	-	0/1/1/1	-
3	EDO	J	120	-	-	0/1/1/1	-
3	EDO	N	122	-	-	1/1/1/1	-
3	EDO	N	121	-	-	0/1/1/1	-
2	5GP	M	207	-	-	3/10/26/26	0/3/3/3
3	EDO	A	121	-	-	1/1/1/1	-
3	EDO	J	121	-	-	0/1/1/1	-
3	EDO	B	125	-	-	1/1/1/1	-
3	EDO	N	125	-	-	0/1/1/1	-
2	5GP	A	201	-	-	4/10/26/26	0/3/3/3
2	5GP	B	200	-	-	3/10/26/26	0/3/3/3
3	EDO	A	122	-	-	1/1/1/1	-

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	203	5GP	C6-N1	-2.83	1.33	1.38
2	I	205	5GP	C6-N1	-2.59	1.34	1.38
2	A	201	5GP	C6-N1	-2.58	1.34	1.38
2	N	206	5GP	C6-N1	-2.55	1.34	1.38
2	M	207	5GP	C6-N1	-2.39	1.34	1.38

The worst 5 of 59 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	201	5GP	C5-C4-N3	-5.13	120.23	128.39
2	E	203	5GP	C5-C4-N3	-5.00	120.44	128.39
2	F	202	5GP	C5-C4-N3	-4.87	120.64	128.39
2	I	205	5GP	C5-C4-N3	-4.65	120.98	128.39
2	M	207	5GP	C5-C4-N3	-4.55	121.15	128.39

There are no chirality outliers.

5 of 34 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	5GP	C5'-O5'-P-OP1
2	E	203	5GP	C5'-O5'-P-OP2
2	F	202	5GP	C5'-O5'-P-OP1
2	J	204	5GP	C5'-O5'-P-OP1
2	M	207	5GP	C5'-O5'-P-OP3

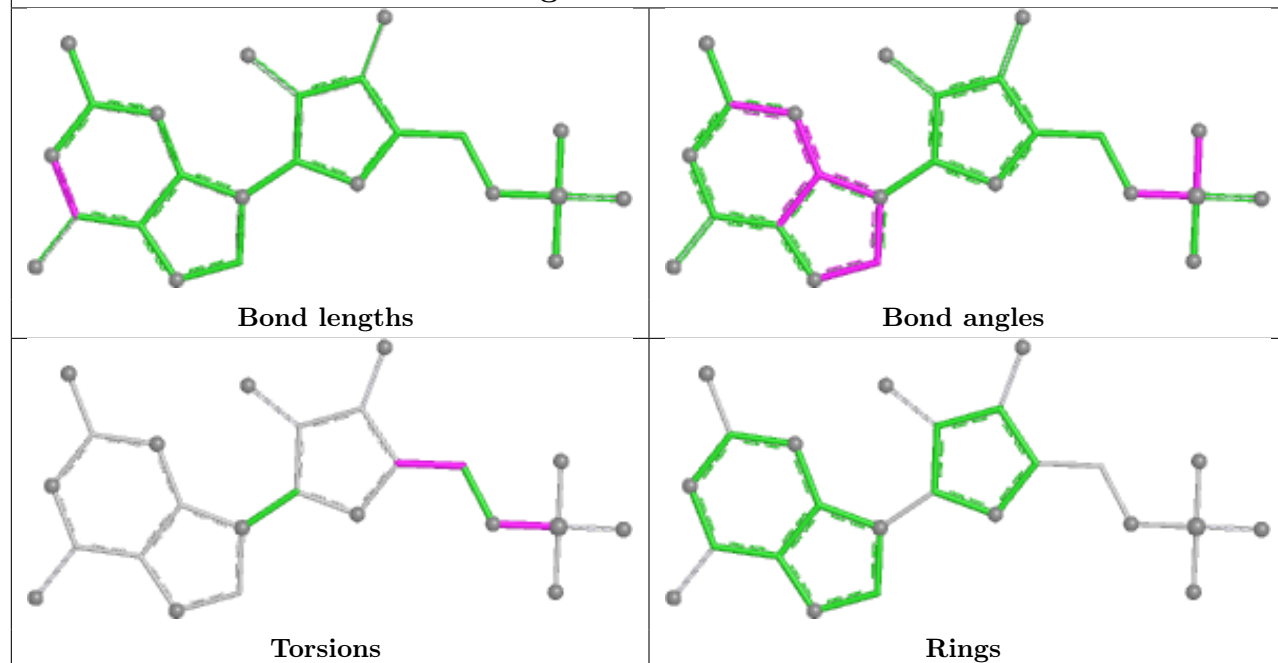
There are no ring outliers.

6 monomers are involved in 12 short contacts:

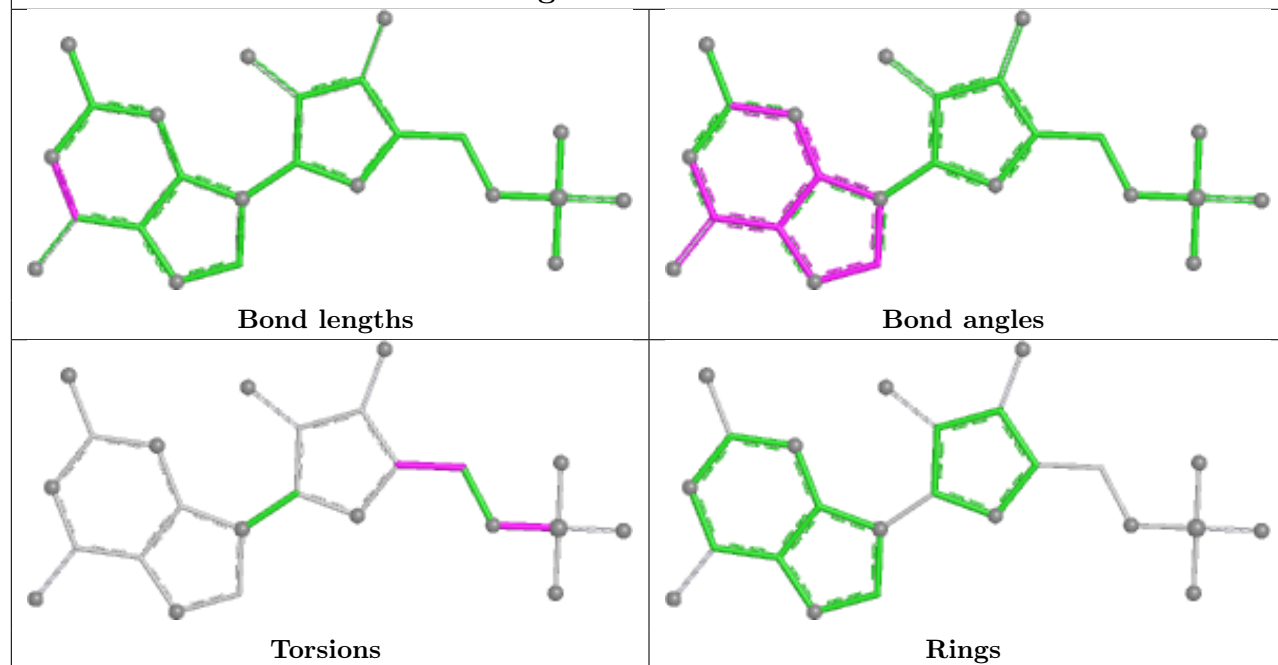
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	124	EDO	1	0
2	J	204	5GP	3	0
3	A	121	EDO	3	0
3	B	125	EDO	4	0
3	N	125	EDO	1	0
3	A	122	EDO	1	0

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

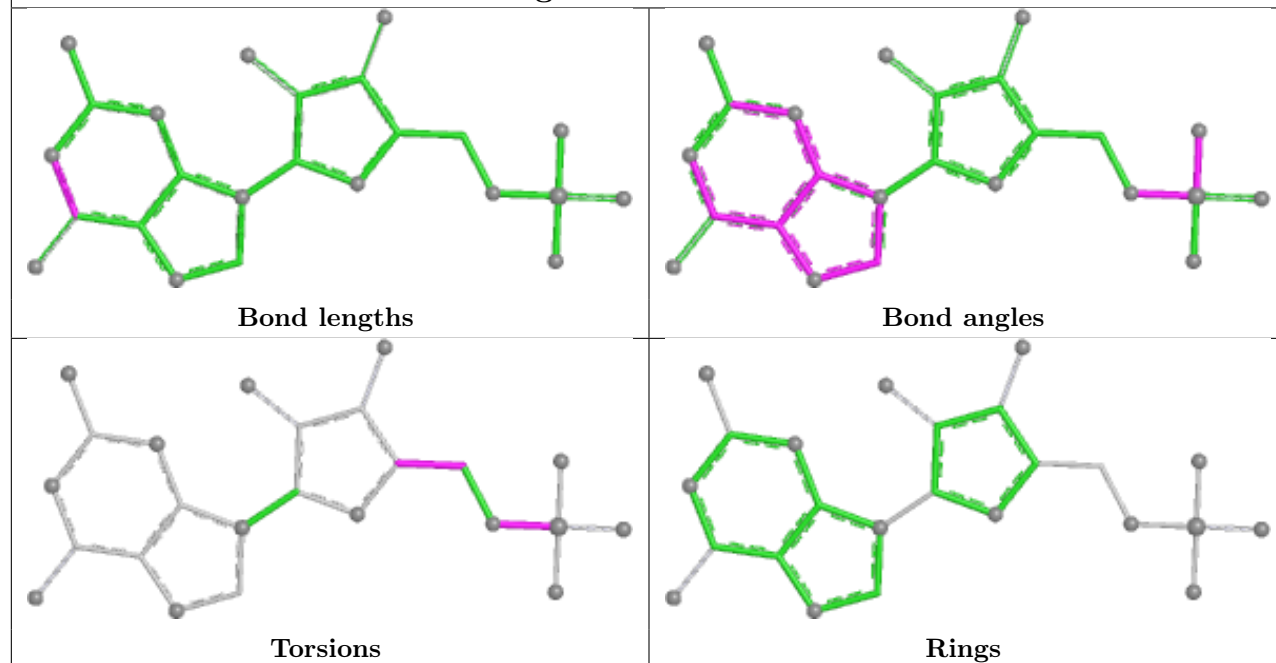
Ligand 5GP I 205



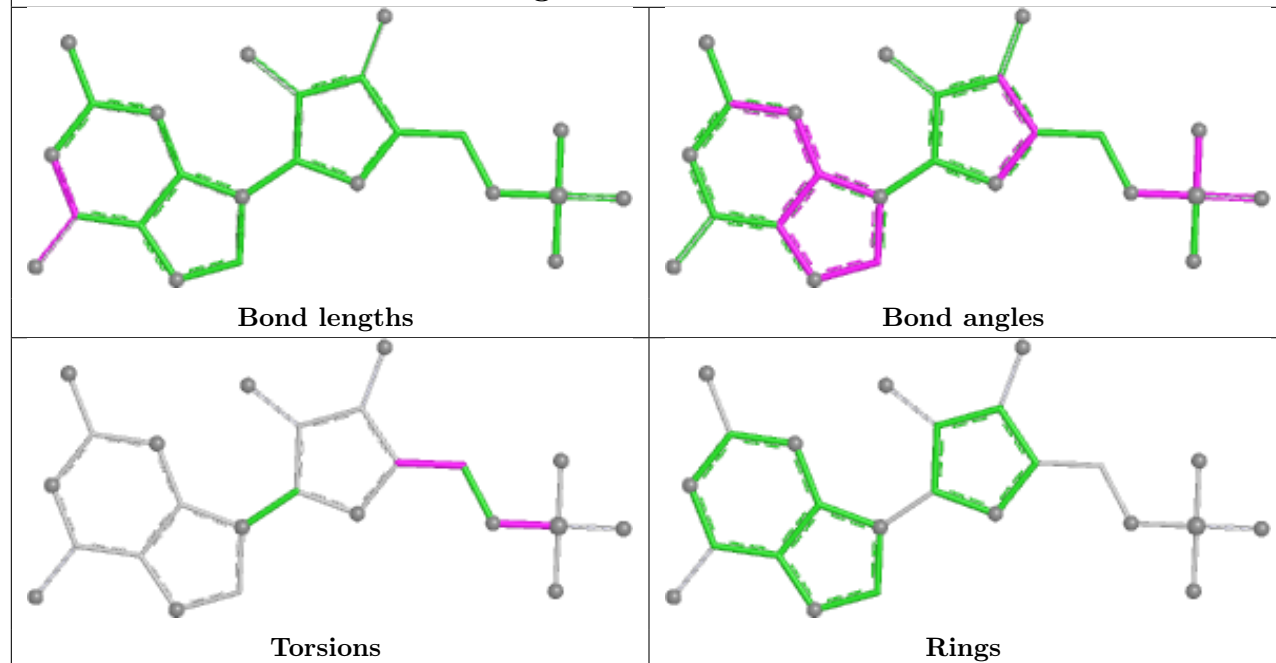
Ligand 5GP J 204



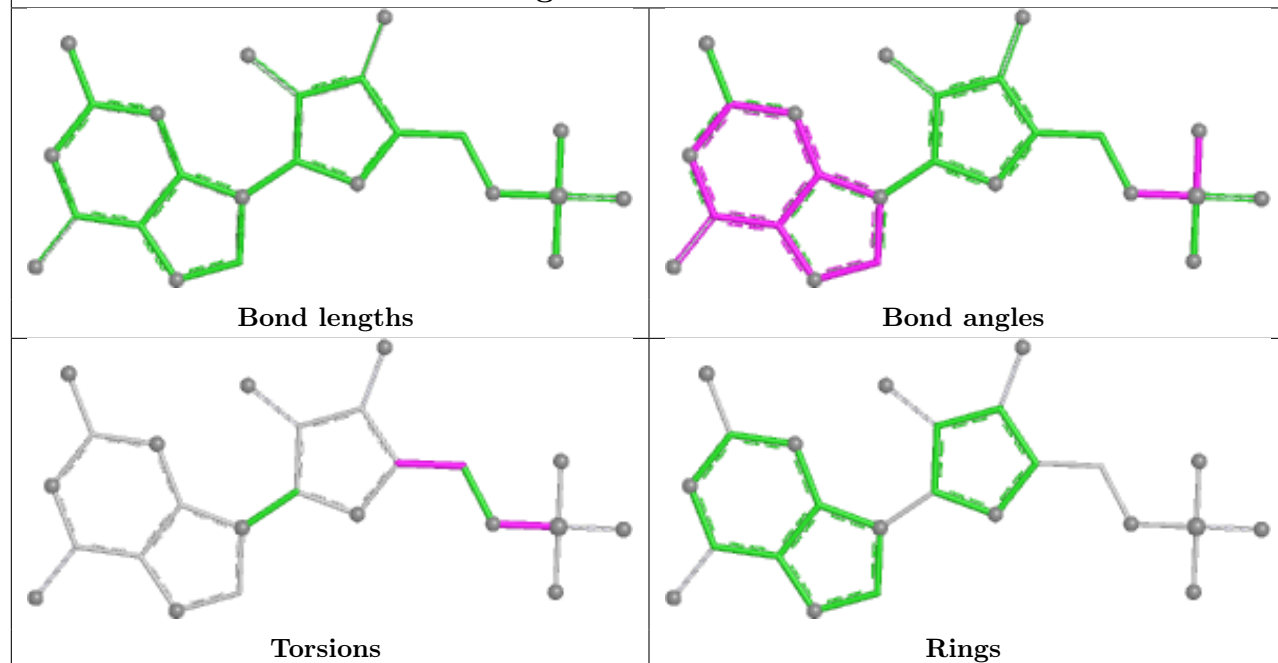
Ligand 5GP E 203



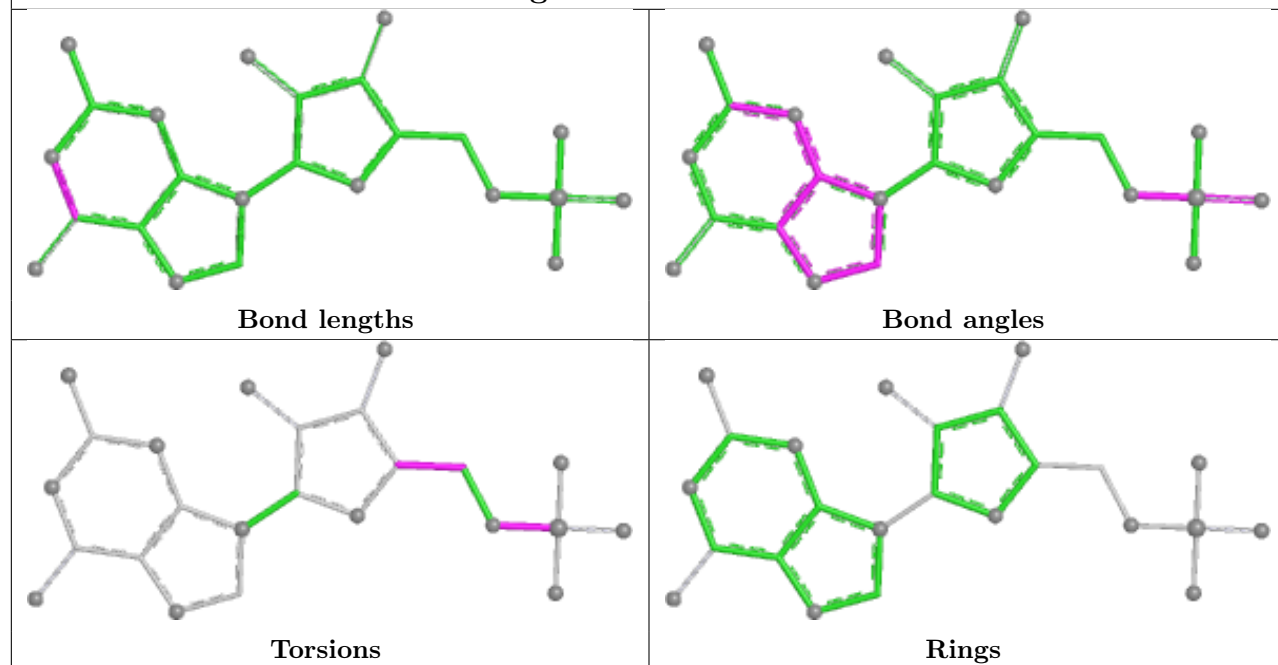
Ligand 5GP N 206

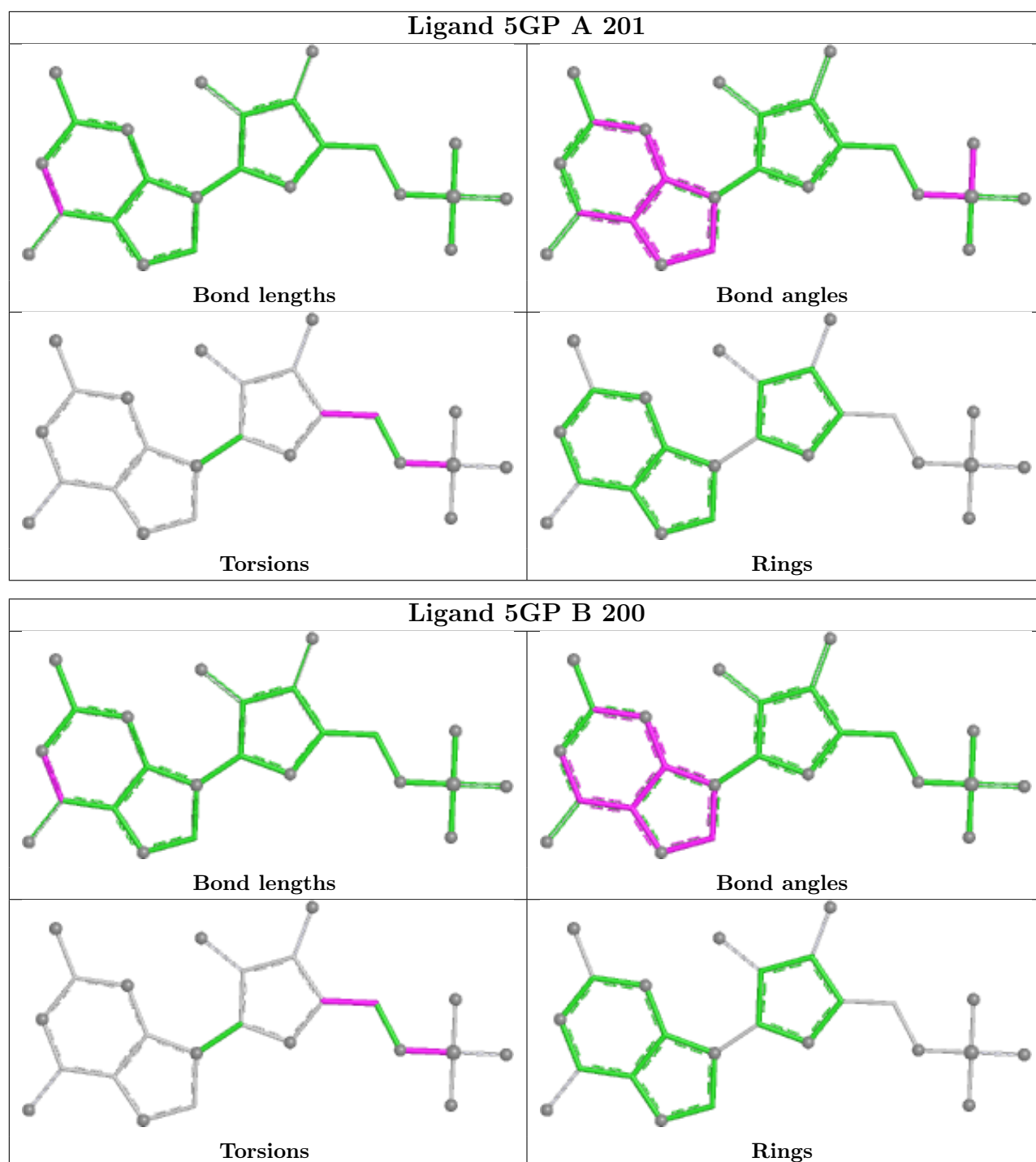


Ligand 5GP F 202



Ligand 5GP M 207





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	117/119 (98%)	0.47	6 (5%)	33	34	9, 19, 30, 47	8 (6%)
1	B	118/119 (99%)	-0.02	4 (3%)	48	51	6, 15, 25, 31	8 (6%)
1	E	115/119 (96%)	0.26	4 (3%)	47	49	8, 17, 27, 48	7 (6%)
1	F	118/119 (99%)	0.50	8 (6%)	23	23	9, 18, 30, 37	9 (7%)
1	I	114/119 (95%)	0.12	3 (2%)	57	59	9, 16, 26, 40	7 (6%)
1	J	119/119 (100%)	0.33	8 (6%)	24	23	8, 17, 35, 44	10 (8%)
1	M	115/119 (96%)	0.06	5 (4%)	40	42	7, 15, 25, 35	9 (7%)
1	N	115/119 (96%)	0.04	5 (4%)	40	42	8, 15, 24, 40	11 (9%)
All	All	931/952 (97%)	0.22	43 (4%)	37	40	6, 17, 28, 48	69 (7%)

The worst 5 of 43 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	2	ALA	10.2
1	J	2	ALA	8.7
1	E	115	ALA	7.2
1	F	91	ARG	6.6
1	J	91	ARG	5.9

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 ⓘ

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

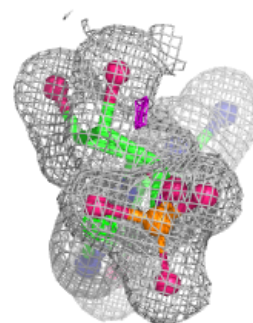
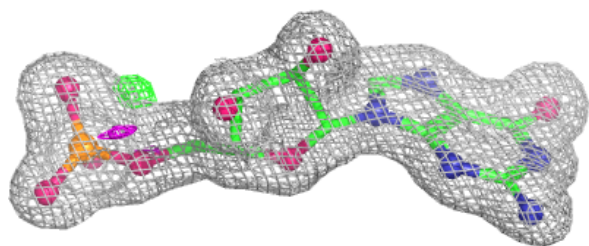
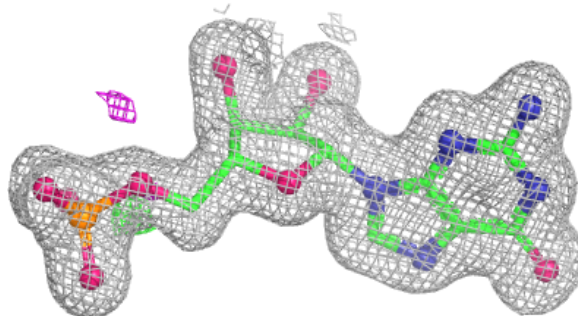
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	EDO	N	125	4/4	0.60	0.20	41,42,42,45	0
3	EDO	B	124	4/4	0.74	0.17	40,42,43,44	0
3	EDO	A	121	4/4	0.76	0.12	34,36,36,37	0
3	EDO	I	123	4/4	0.77	0.19	43,44,44,45	0
3	EDO	B	125	4/4	0.77	0.15	53,53,53,54	0
3	EDO	N	121	4/4	0.78	0.16	29,30,32,35	0
3	EDO	N	124	4/4	0.80	0.15	26,32,32,36	0
3	EDO	I	122	4/4	0.80	0.18	23,26,26,28	0
3	EDO	F	120	4/4	0.81	0.17	20,24,25,26	0
3	EDO	J	121	4/4	0.86	0.12	28,31,31,33	0
3	EDO	B	121	4/4	0.86	0.12	19,25,28,32	0
3	EDO	M	121	4/4	0.88	0.11	23,25,27,30	0
3	EDO	B	123	4/4	0.88	0.11	30,33,35,38	0
3	EDO	A	122	4/4	0.89	0.13	39,39,39,40	0
3	EDO	I	120	4/4	0.90	0.11	20,25,28,32	0
3	EDO	M	120	4/4	0.90	0.11	24,25,25,25	0
3	EDO	N	122	4/4	0.91	0.09	28,29,29,30	0
3	EDO	A	120	4/4	0.91	0.09	26,28,28,30	0
3	EDO	E	120	4/4	0.91	0.09	28,29,31,32	0
3	EDO	J	120	4/4	0.92	0.09	24,25,25,25	0
3	EDO	I	121	4/4	0.92	0.10	23,25,28,30	0
3	EDO	N	123	4/4	0.94	0.11	17,25,25,26	0
3	EDO	B	122	4/4	0.96	0.07	21,22,23,27	0
2	5GP	A	201	24/24	0.96	0.06	19,20,22,25	0
3	EDO	N	120	4/4	0.96	0.06	16,16,17,20	0
2	5GP	N	206	24/24	0.96	0.06	13,14,22,27	0
2	5GP	I	205	24/24	0.97	0.05	14,15,20,22	0
2	5GP	J	204	24/24	0.97	0.06	16,18,20,23	0
2	5GP	M	207	24/24	0.97	0.05	13,15,18,21	0
2	5GP	F	202	24/24	0.97	0.06	17,18,24,27	0
2	5GP	B	200	24/24	0.98	0.05	13,14,18,21	0
2	5GP	E	203	24/24	0.98	0.05	15,17,19,22	0
3	EDO	B	120	4/4	0.98	0.05	17,18,19,19	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.

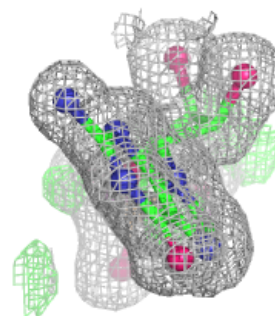
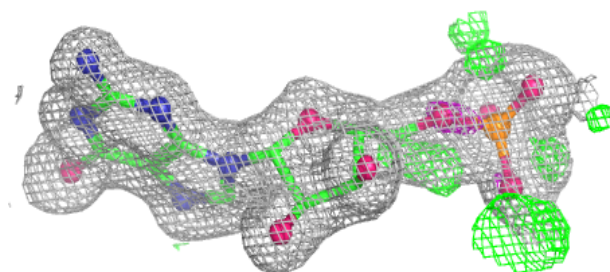
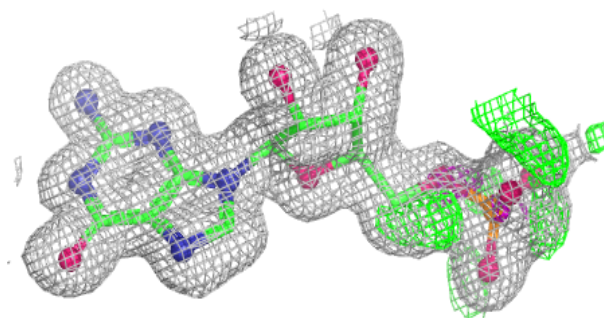
Electron density around 5GP A 201:

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



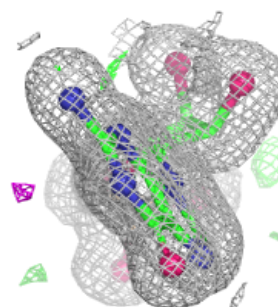
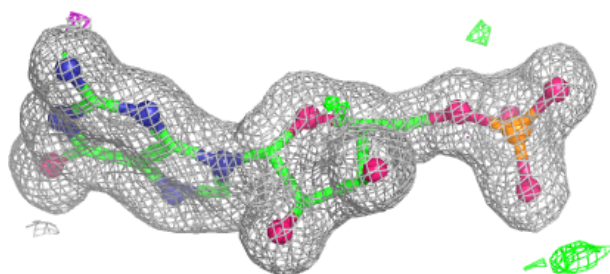
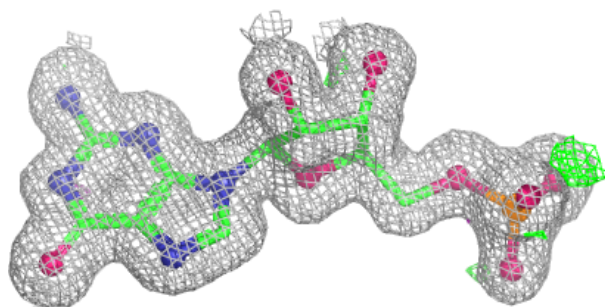
Electron density around 5GP N 206:

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

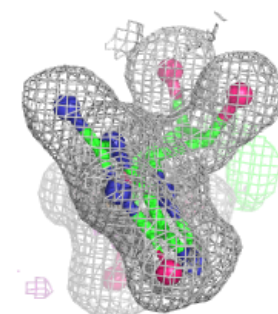
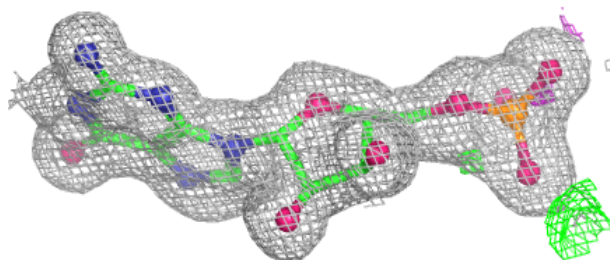
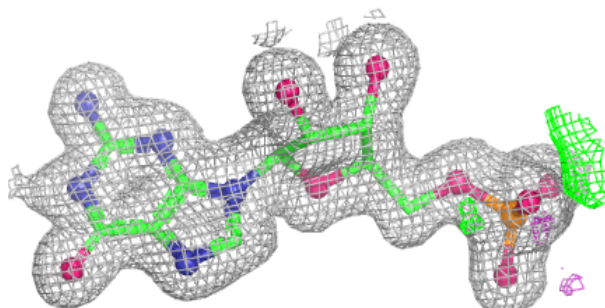


Electron density around 5GP I 205:

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

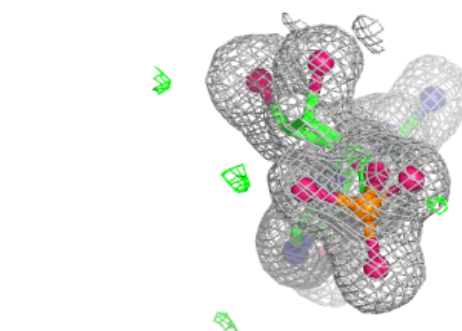
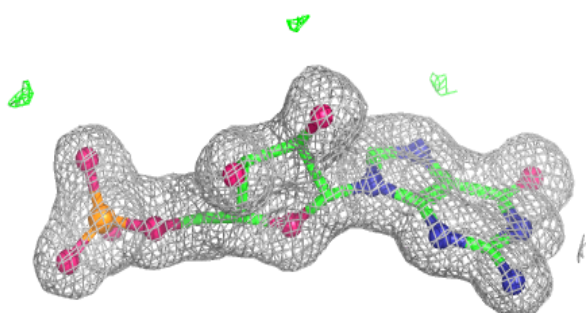
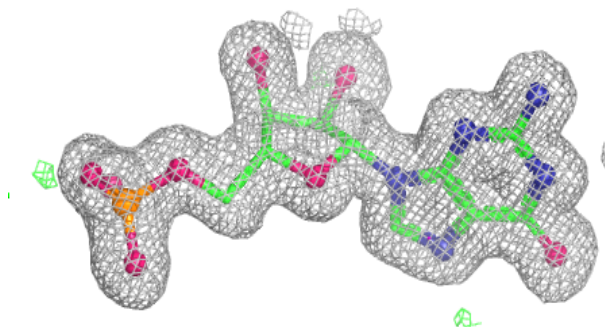
**Electron density around 5GP J 204:**

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

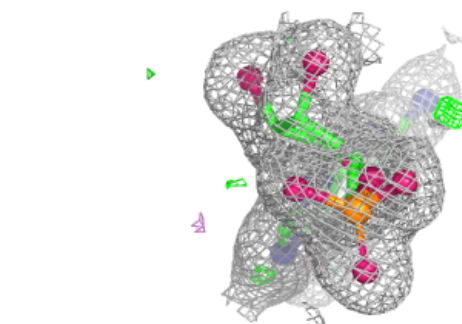
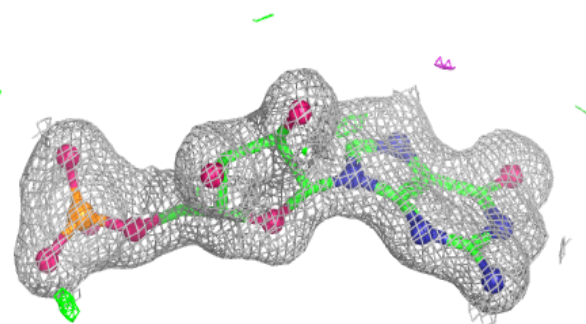
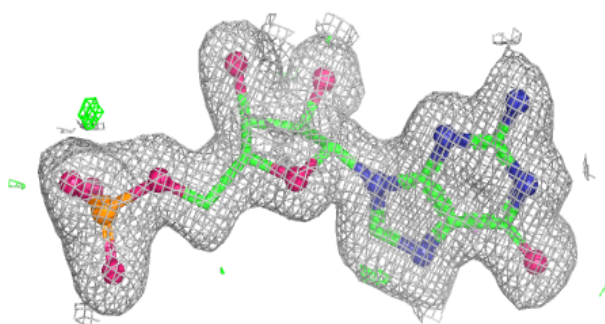


Electron density around 5GP M 207:

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

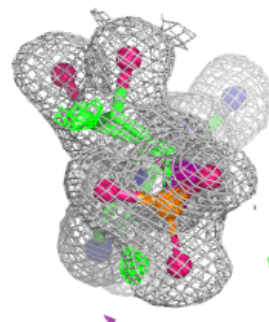
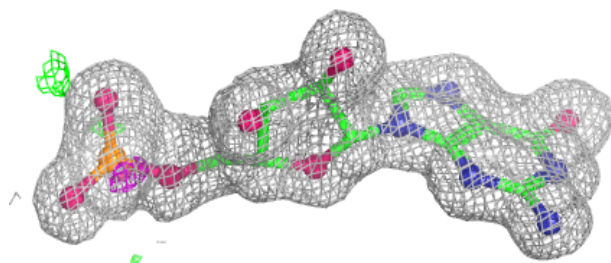
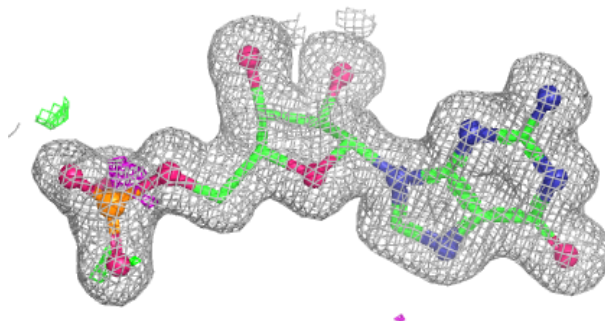
**Electron density around 5GP F 202:**

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

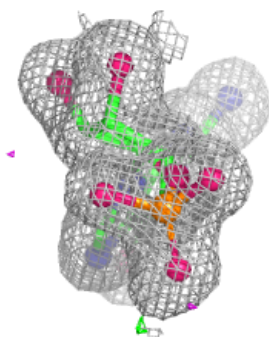
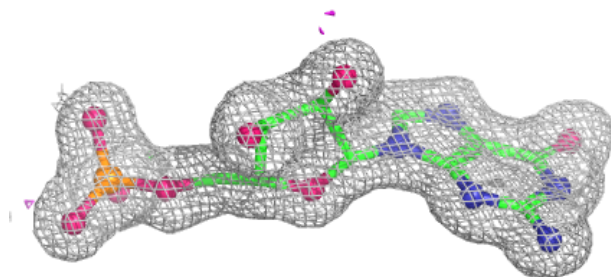
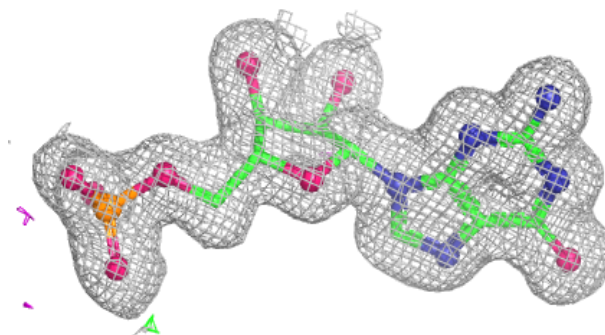


Electron density around 5GP B 200:

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

**Electron density around 5GP E 203:**

$2mF_o-DF_c$ (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.