



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 05:28 AM UTC

PDB ID : 5OYH / pdb_00005oyh
Title : crystal structure of the catalytic core of a rhodopsin-guanylyl cyclase with converted specificity in complex with ATPalphaS
Authors : Broser, M.; Scheib, U.; Hegemann, P.
Deposited on : 2017-09-09
Resolution : 2.25 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

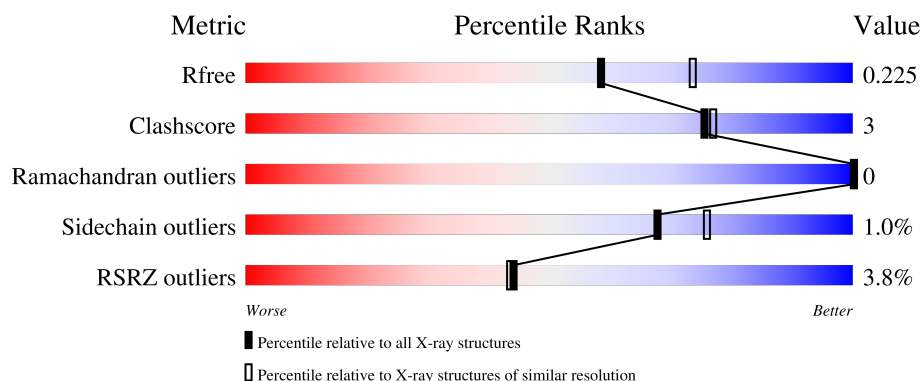
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.25 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.



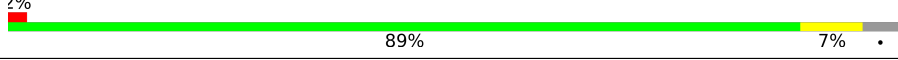
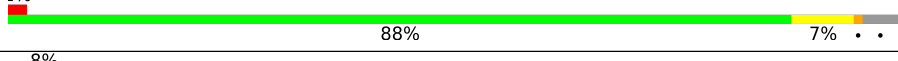
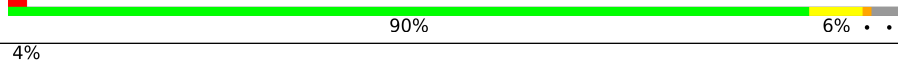
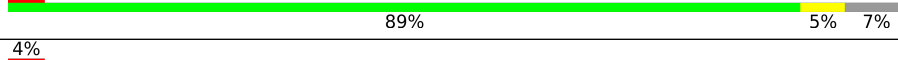
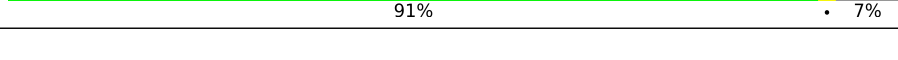
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3416 (2.26-2.22)
Clashscore	190562	3556 (2.26-2.22)
Ramachandran outliers	187476	3500 (2.26-2.22)
Sidechain outliers	187428	3501 (2.26-2.22)
RSRZ outliers	180081	3415 (2.26-2.22)

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	193	6% 86% 9% 5%
1	B	193	2% 88% 7% 5%
1	C	193	4% 90% 6% 5%
1	D	193	3% 92% . .
1	E	193	4% 87% 7% 6%

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Mol	Chain	Length	Quality of chain
1	F	193	 % 87% 9% •
1	G	193	 5% 85% 10% •
1	H	193	 2% 89% 7% •
1	I	193	 4% 83% 11% 6%
1	J	193	 2% 88% 7% • •
1	K	193	 8% 88% 7% • 5%
1	L	193	 2% 90% 6% • •
1	M	193	 4% 89% 5% 7%
1	N	193	 4% 83% 10% • 6%
1	O	193	 4% 85% 8% 7%
1	P	193	 4% 91% • 7%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 24979 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 Nucleotide cyclase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	184	Total	C	N	O	S	0	0	0
			1423	904	237	274	8			
1	B	184	Total	C	N	O	S	0	0	0
			1424	905	238	274	7			
1	C	184	Total	C	N	O	S	0	0	0
			1428	908	239	274	7			
1	D	185	Total	C	N	O	S	0	0	0
			1436	913	240	275	8			
1	E	182	Total	C	N	O	S	0	0	0
			1396	887	231	271	7			
1	F	185	Total	C	N	O	S	0	0	0
			1430	909	238	275	8			
1	G	185	Total	C	N	O	S	0	0	0
			1428	907	238	275	8			
1	H	185	Total	C	N	O	S	0	0	0
			1433	911	239	275	8			
1	I	182	Total	C	N	O	S	0	1	0
			1414	900	235	271	8			
1	J	185	Total	C	N	O	S	0	1	0
			1438	915	239	275	9			
1	K	183	Total	C	N	O	S	0	0	0
			1412	896	236	273	7			
1	L	185	Total	C	N	O	S	0	0	0
			1436	913	240	275	8			
1	M	180	Total	C	N	O	S	0	0	0
			1392	886	232	267	7			
1	N	181	Total	C	N	O	S	0	0	0
			1405	895	234	268	8			
1	O	179	Total	C	N	O	S	0	0	0
			1383	881	230	265	7			
1	P	179	Total	C	N	O	S	0	0	0
			1384	881	230	266	7			

There are 176 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
A	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
A	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
A	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
A	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
A	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
A	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
A	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
A	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
A	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
A	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
B	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
B	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
B	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
B	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
B	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
B	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
C	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
C	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
C	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
C	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
C	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
C	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
D	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
D	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
D	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
D	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
D	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
D	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
D	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
D	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
D	632	HIS	-	expression tag	UNP A0A1Y2HEJ3

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Chain	Residue	Modelled	Actual	Comment	Reference
D	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
D	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
E	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
E	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
E	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
E	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
E	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
E	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
F	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
F	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
F	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
F	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
F	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
F	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
G	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
G	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
G	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
G	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
G	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
G	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
H	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
H	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
H	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
H	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
H	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
H	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
H	630	HIS	-	expression tag	UNP A0A1Y2HEJ3

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Chain	Residue	Modelled	Actual	Comment	Reference
H	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
H	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
H	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
H	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
I	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
I	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
I	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
I	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
I	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
I	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
J	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
J	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
J	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
J	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
J	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
J	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
K	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
K	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
K	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
K	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
K	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
K	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
L	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
L	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
L	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
L	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
L	628	GLU	-	expression tag	UNP A0A1Y2HEJ3

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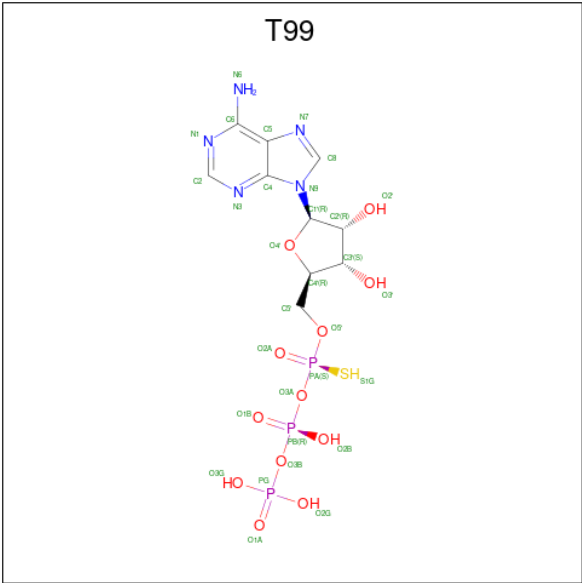
Chain	Residue	Modelled	Actual	Comment	Reference
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L	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
L	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
L	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
L	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
L	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
M	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
M	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
M	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
M	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
M	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
M	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
N	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
N	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
N	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
N	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
N	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
N	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
O	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
O	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3
O	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
O	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
O	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
O	634	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	442	MET	-	initiating methionine	UNP A0A1Y2HEJ3
P	497	LYS	GLU	engineered mutation	UNP A0A1Y2HEJ3
P	566	ASP	CYS	engineered mutation	UNP A0A1Y2HEJ3

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Chain	Residue	Modelled	Actual	Comment	Reference
P	627	LEU	-	expression tag	UNP A0A1Y2HEJ3
P	628	GLU	-	expression tag	UNP A0A1Y2HEJ3
P	629	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	630	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	631	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	632	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	633	HIS	-	expression tag	UNP A0A1Y2HEJ3
P	634	HIS	-	expression tag	UNP A0A1Y2HEJ3

- Molecule 2 is ADENOSINE-5'-SP-ALPHA-THIO-TRIPHOSPHATE (CCD ID: T99) (formula: C₁₀H₁₆N₅O₁₂P₃S).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	B	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	C	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	D	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	E	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	F	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	G	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		

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Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	H	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	I	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	J	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	K	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	L	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	M	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	N	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	O	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		
2	P	1	Total	C	N	O	P	S	0	0
			31	10	5	12	3	1		

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

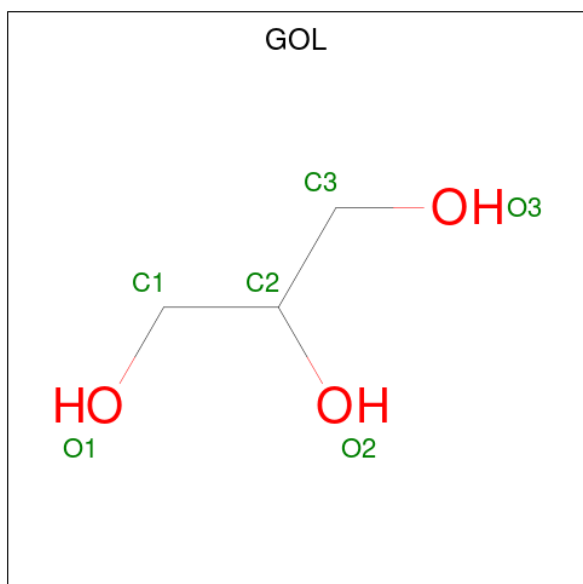
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Ca	0	0
			1	1		
3	B	1	Total	Ca	0	0
			1	1		
3	C	1	Total	Ca	0	0
			1	1		
3	D	1	Total	Ca	0	0
			1	1		
3	E	1	Total	Ca	0	0
			1	1		
3	F	1	Total	Ca	0	0
			1	1		
3	G	1	Total	Ca	0	0
			1	1		
3	H	1	Total	Ca	0	0
			1	1		
3	I	1	Total	Ca	0	0
			1	1		
3	J	1	Total	Ca	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	K	1	Total	Ca	0	0
			1	1		
3	L	1	Total	Ca	0	0
			1	1		
3	M	1	Total	Ca	0	0
			1	1		
3	N	1	Total	Ca	0	0
			1	1		
3	O	1	Total	Ca	0	0
			1	1		
3	P	1	Total	Ca	0	0
			1	1		

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			6	3	3		
4	A	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	E	1	Total	C	O	0	0
			6	3	3		
4	F	1	Total	C	O	0	0
			6	3	3		
4	F	1	Total	C	O	0	0
			6	3	3		
4	G	1	Total	C	O	0	0
			6	3	3		
4	I	1	Total	C	O	0	0
			6	3	3		
4	J	1	Total	C	O	0	0
			6	3	3		
4	J	1	Total	C	O	0	0
			6	3	3		
4	K	1	Total	C	O	0	0
			6	3	3		
4	L	1	Total	C	O	0	0
			6	3	3		
4	O	1	Total	C	O	0	0
			6	3	3		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	100	Total	O	0	0
			100	100		
5	B	139	Total	O	0	0
			139	139		
5	C	123	Total	O	0	0
			123	123		
5	D	176	Total	O	0	0
			176	176		
5	E	89	Total	O	0	0
			89	89		
5	F	115	Total	O	0	0
			115	115		
5	G	125	Total	O	0	0
			125	125		
5	H	169	Total	O	0	0
			169	169		
5	I	72	Total	O	0	0
			72	72		

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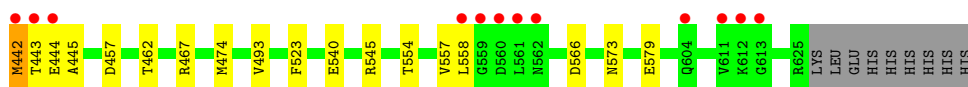
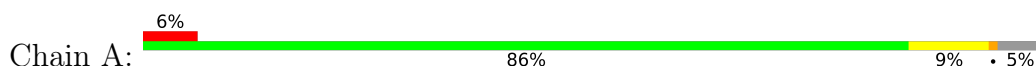
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	J	100	Total 100	O 100	0	0
5	K	67	Total 67	O 67	0	0
5	L	138	Total 138	O 138	0	0
5	M	104	Total 104	O 104	0	0
5	N	63	Total 63	O 63	0	0
5	O	82	Total 82	O 82	0	0
5	P	53	Total 53	O 53	0	0

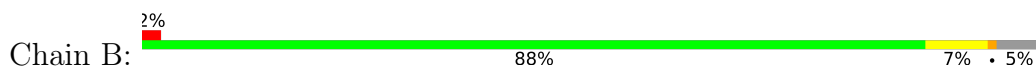
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Nucleotide cyclase



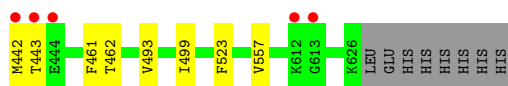
- Molecule 1: Nucleotide cyclase



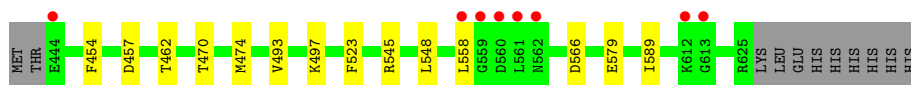
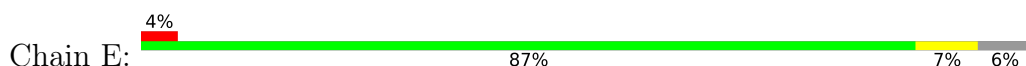
- Molecule 1: Nucleotide cyclase



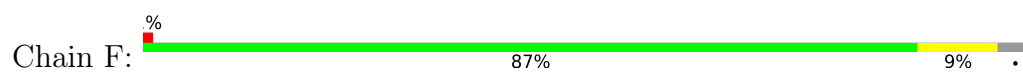
- Molecule 1: Nucleotide cyclase



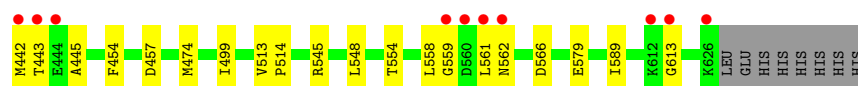
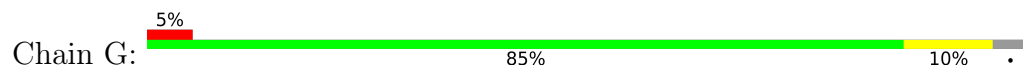
- Molecule 1: Nucleotide cyclase



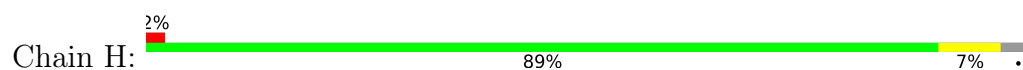
- Molecule 1: Nucleotide cyclase



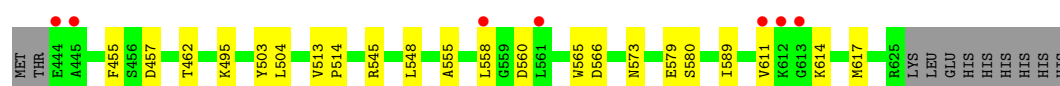
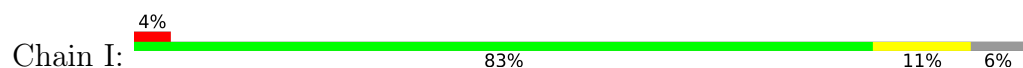
• Molecule 1: Nucleotide cyclase



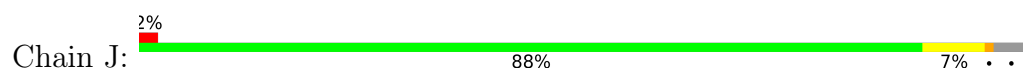
• Molecule 1: Nucleotide cyclase



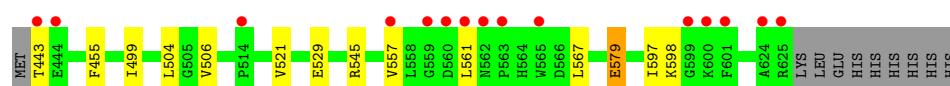
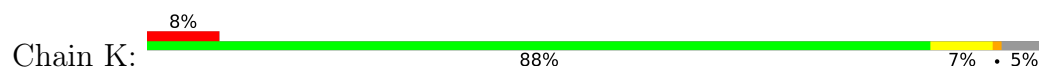
• Molecule 1: Nucleotide cyclase



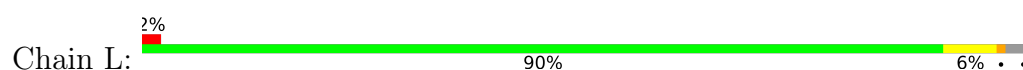
• Molecule 1: Nucleotide cyclase



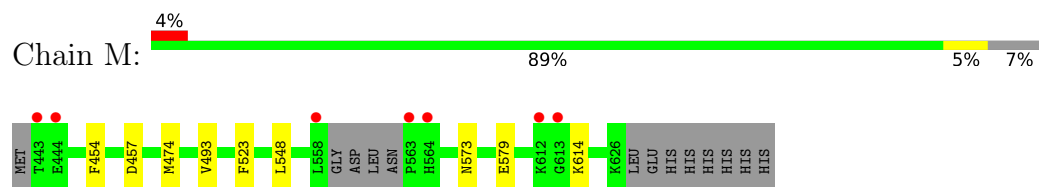
• Molecule 1: Nucleotide cyclase



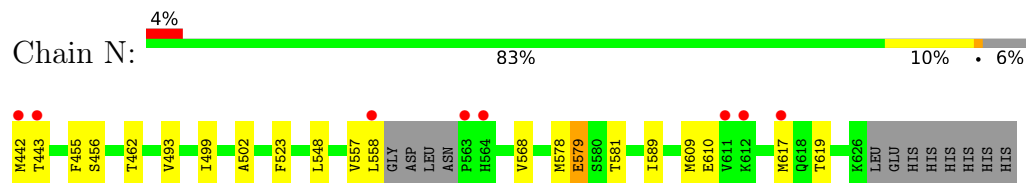
• Molecule 1: Nucleotide cyclase



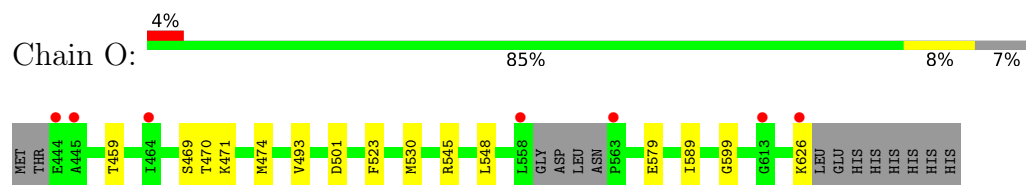
- Molecule 1: Nucleotide cyclase



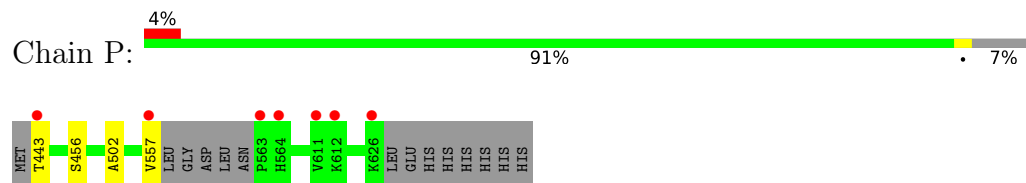
- Molecule 1: Nucleotide cyclase



- Molecule 1: Nucleotide cyclase



- Molecule 1: Nucleotide cyclase



4 Data and refinement statistics

Property	Value	Source
Space group	I 41	Depositor
Cell constants a, b, c, α , β , γ	193.28Å 193.28Å 225.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.90 – 2.25 45.90 – 2.25	Depositor EDS
% Data completeness (in resolution range)	99.7 (45.90-2.25) 99.8 (45.90-2.25)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.73 (at 2.24Å)	Xtriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.182 , 0.224 0.185 , 0.225	Depositor DCC
R_{free} test set	2100 reflections (1.08%)	wwPDB-VP
Wilson B-factor (Å ²)	36.2	Xtriage
Anisotropy	0.042	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 45.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.53$, $\langle L^2 \rangle = 0.36$	Xtriage
Estimated twinning fraction	0.000 for -h,k,-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	24979	wwPDB-VP
Average B, all atoms (Å ²)	40.0	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 35.39 % 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 5.8784e-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: T99, GOL, CA

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	0.39	0/1451	0.55	0/1968
1	B	0.45	0/1452	0.57	0/1969
1	C	0.40	0/1456	0.53	0/1973
1	D	0.47	0/1464	0.58	0/1983
1	E	0.33	0/1424	0.49	0/1934
1	F	0.37	0/1458	0.50	0/1977
1	G	0.43	0/1456	0.55	0/1975
1	H	0.49	0/1461	0.60	0/1980
1	I	0.32	0/1445	0.48	0/1959
1	J	0.39	0/1469	0.56	0/1990
1	K	0.35	0/1440	0.52	0/1954
1	L	0.44	0/1464	0.55	0/1983
1	M	0.40	0/1419	0.58	1/1923 (0.1%)
1	N	0.34	0/1432	0.51	0/1938
1	O	0.32	0/1410	0.46	0/1911
1	P	0.30	0/1411	0.46	0/1912
All	All	0.39	0/23112	0.53	1/31329 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	614	LYS	N-CA-C	-10.84	102.27	114.62

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	1423	0	1419	15	0
1	B	1424	0	1423	9	0
1	C	1428	0	1434	7	0
1	D	1436	0	1443	8	0
1	E	1396	0	1374	8	0
1	F	1430	0	1425	11	0
1	G	1428	0	1421	16	0
1	H	1433	0	1434	13	0
1	I	1414	0	1414	14	0
1	J	1438	0	1443	8	0
1	K	1412	0	1401	7	0
1	L	1436	0	1443	6	0
1	M	1392	0	1388	7	0
1	N	1405	0	1410	16	0
1	O	1383	0	1374	9	0
1	P	1384	0	1374	2	0
2	A	31	0	0	0	0
2	B	31	0	0	0	0
2	C	31	0	0	1	0
2	D	31	0	0	1	0
2	E	31	0	0	0	0
2	F	31	0	0	1	0
2	G	31	0	0	0	0
2	H	31	0	0	0	0
2	I	31	0	0	0	0
2	J	31	0	0	1	0
2	K	31	0	0	0	0
2	L	31	0	0	0	0
2	M	31	0	0	0	0
2	N	31	0	0	0	0
2	O	31	0	0	1	0
2	P	31	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
3	K	1	0	0	0	0
3	L	1	0	0	0	0
3	M	1	0	0	0	0
3	N	1	0	0	0	0
3	O	1	0	0	0	0
3	P	1	0	0	0	0
4	A	12	0	16	0	0
4	C	12	0	16	0	0
4	D	6	0	8	0	0
4	E	6	0	8	0	0
4	F	12	0	16	0	0
4	G	6	0	8	0	0
4	I	6	0	8	0	0
4	J	12	0	16	0	0
4	K	6	0	8	0	0
4	L	6	0	8	0	0
4	O	6	0	8	0	0
5	A	100	0	0	0	0
5	B	139	0	0	1	0
5	C	123	0	0	0	0
5	D	176	0	0	0	0
5	E	89	0	0	1	0
5	F	115	0	0	1	0
5	G	125	0	0	2	0
5	H	169	0	0	3	0
5	I	72	0	0	0	0
5	J	100	0	0	1	0
5	K	67	0	0	1	0
5	L	138	0	0	0	0
5	M	104	0	0	0	0
5	N	63	0	0	0	0
5	O	82	0	0	0	0
5	P	53	0	0	0	0
All	All	24979	0	22740	140	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 3.

The worst 5 of 140 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:A:443:THR:HG22	1:A:444:GLU:HG3	1.63	0.80
1:M:474:MET:HE3	1:N:568:VAL:HG11	1.64	0.79
1:G:442:MET:HE1	1:G:554:THR:HG22	1.66	0.75
1:L:443:THR:HB	1:L:557:VAL:HB	1.69	0.74
1:I:462:THR:OG1	1:J:577:ARG:NH2	2.23	0.71

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	182/193 (94%)	180 (99%)	2 (1%)	0	100	100
1	B	182/193 (94%)	178 (98%)	4 (2%)	0	100	100
1	C	182/193 (94%)	180 (99%)	2 (1%)	0	100	100
1	D	183/193 (95%)	178 (97%)	5 (3%)	0	100	100
1	E	180/193 (93%)	179 (99%)	1 (1%)	0	100	100
1	F	183/193 (95%)	180 (98%)	3 (2%)	0	100	100
1	G	183/193 (95%)	180 (98%)	3 (2%)	0	100	100
1	H	183/193 (95%)	178 (97%)	5 (3%)	0	100	100
1	I	181/193 (94%)	179 (99%)	2 (1%)	0	100	100
1	J	184/193 (95%)	182 (99%)	2 (1%)	0	100	100
1	K	181/193 (94%)	176 (97%)	5 (3%)	0	100	100
1	L	183/193 (95%)	178 (97%)	5 (3%)	0	100	100
1	M	176/193 (91%)	172 (98%)	4 (2%)	0	100	100
1	N	177/193 (92%)	175 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	O	175/193 (91%)	172 (98%)	3 (2%)	0	100	100
1	P	175/193 (91%)	173 (99%)	2 (1%)	0	100	100
All	All	2890/3088 (94%)	2840 (98%)	50 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	155/165 (94%)	154 (99%)	1 (1%)	78	83
1	B	155/165 (94%)	151 (97%)	4 (3%)	40	48
1	C	156/165 (94%)	156 (100%)	0	100	100
1	D	157/165 (95%)	156 (99%)	1 (1%)	78	83
1	E	150/165 (91%)	149 (99%)	1 (1%)	76	81
1	F	155/165 (94%)	152 (98%)	3 (2%)	50	59
1	G	155/165 (94%)	154 (99%)	1 (1%)	78	83
1	H	156/165 (94%)	155 (99%)	1 (1%)	78	83
1	I	154/165 (93%)	153 (99%)	1 (1%)	78	83
1	J	157/165 (95%)	154 (98%)	3 (2%)	50	59
1	K	153/165 (93%)	150 (98%)	3 (2%)	48	58
1	L	157/165 (95%)	155 (99%)	2 (1%)	61	71
1	M	151/165 (92%)	151 (100%)	0	100	100
1	N	153/165 (93%)	150 (98%)	3 (2%)	48	58
1	O	149/165 (90%)	148 (99%)	1 (1%)	76	81
1	P	149/165 (90%)	149 (100%)	0	100	100
All	All	2462/2640 (93%)	2437 (99%)	25 (1%)	68	76

5 of 25 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	J	579	GLU
1	K	561	LEU
1	O	579	GLU
1	K	499	ILE
1	K	579	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
1	L	564	HIS
1	I	562	ASN
1	E	604	GLN
1	E	562	ASN
1	F	618	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 47 ligands modelled in this entry, 16 are monoatomic - leaving 31 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	GOL	F	701	-	5,5,5	0.45	0	5,5,5	0.48	0
2	T99	H	701	3	29,33,33	0.52	0	42,52,52	0.56	0
2	T99	E	701	3	29,33,33	0.36	0	42,52,52	0.50	0
2	T99	J	703	3	29,33,33	0.64	0	42,52,52	0.91	1 (2%)
2	T99	F	702	3	29,33,33	0.59	1 (3%)	42,52,52	0.67	0
4	GOL	O	703	-	5,5,5	0.39	0	5,5,5	0.31	0
2	T99	L	702	3	29,33,33	0.40	0	42,52,52	0.72	1 (2%)
4	GOL	K	703	-	5,5,5	0.38	0	5,5,5	0.45	0
4	GOL	F	703	-	5,5,5	0.36	0	5,5,5	0.46	0
2	T99	C	702	3	29,33,33	0.62	1 (3%)	42,52,52	0.69	1 (2%)
2	T99	O	701	3	29,33,33	0.54	0	42,52,52	0.54	0
4	GOL	C	701	-	5,5,5	0.43	0	5,5,5	0.36	0
2	T99	B	701	3	29,33,33	0.31	0	42,52,52	0.44	0
4	GOL	A	704	-	5,5,5	0.38	0	5,5,5	0.33	0
4	GOL	I	701	-	5,5,5	0.32	0	5,5,5	0.42	0
2	T99	P	701	3	29,33,33	0.68	2 (6%)	42,52,52	0.72	0
2	T99	A	701	3	29,33,33	0.57	1 (3%)	42,52,52	0.86	2 (4%)
2	T99	G	701	3	29,33,33	0.70	1 (3%)	42,52,52	0.85	1 (2%)
2	T99	D	701	3	29,33,33	0.39	0	42,52,52	0.87	2 (4%)
4	GOL	C	704	-	5,5,5	0.44	0	5,5,5	0.48	0
4	GOL	E	703	-	5,5,5	0.43	0	5,5,5	0.39	0
4	GOL	G	703	-	5,5,5	0.41	0	5,5,5	0.47	0
4	GOL	D	702	-	5,5,5	0.41	0	5,5,5	0.55	0
2	T99	M	701	3	29,33,33	0.57	0	42,52,52	0.56	0
2	T99	I	702	3	29,33,33	0.64	1 (3%)	42,52,52	0.62	0
4	GOL	J	702	-	5,5,5	0.41	0	5,5,5	0.44	0
4	GOL	A	703	-	5,5,5	0.49	0	5,5,5	0.42	0
2	T99	N	701	3	29,33,33	0.68	1 (3%)	42,52,52	0.69	0
4	GOL	J	701	-	5,5,5	0.37	0	5,5,5	0.41	0
4	GOL	L	701	-	5,5,5	0.42	0	5,5,5	0.50	0
2	T99	K	701	3	29,33,33	0.43	0	42,52,52	0.53	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	F	701	-	-	0/4/4/4	-
2	T99	H	701	3	-	3/19/38/38	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	T99	E	701	3	-	3/19/38/38	0/3/3/3
2	T99	J	703	3	-	7/19/38/38	0/3/3/3
2	T99	F	702	3	-	6/19/38/38	0/3/3/3
4	GOL	O	703	-	-	0/4/4/4	-
2	T99	L	702	3	-	2/19/38/38	0/3/3/3
4	GOL	K	703	-	-	0/4/4/4	-
4	GOL	F	703	-	-	0/4/4/4	-
2	T99	C	702	3	-	2/19/38/38	0/3/3/3
2	T99	O	701	3	-	2/19/38/38	0/3/3/3
4	GOL	C	701	-	-	0/4/4/4	-
2	T99	B	701	3	-	2/19/38/38	0/3/3/3
4	GOL	A	704	-	-	0/4/4/4	-
4	GOL	I	701	-	-	0/4/4/4	-
2	T99	P	701	3	-	4/19/38/38	0/3/3/3
2	T99	A	701	3	-	4/19/38/38	0/3/3/3
2	T99	G	701	3	-	4/19/38/38	0/3/3/3
2	T99	D	701	3	-	5/19/38/38	0/3/3/3
4	GOL	C	704	-	-	0/4/4/4	-
4	GOL	E	703	-	-	0/4/4/4	-
4	GOL	G	703	-	-	0/4/4/4	-
4	GOL	D	702	-	-	0/4/4/4	-
2	T99	M	701	3	-	4/19/38/38	0/3/3/3
2	T99	I	702	3	-	7/19/38/38	0/3/3/3
4	GOL	J	702	-	-	1/4/4/4	-
4	GOL	A	703	-	-	0/4/4/4	-
2	T99	N	701	3	-	6/19/38/38	0/3/3/3
4	GOL	J	701	-	-	0/4/4/4	-
4	GOL	L	701	-	-	0/4/4/4	-
2	T99	K	701	3	-	2/19/38/38	0/3/3/3

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	N	701	T99	PB-O2B	-2.40	1.44	1.55
2	G	701	T99	PB-O2B	-2.24	1.45	1.55
2	I	702	T99	PA-O2A	2.23	1.51	1.46
2	F	702	T99	PB-O2B	-2.14	1.45	1.55
2	P	701	T99	PG-O1A	2.13	1.57	1.50

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

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
2	D	701	T99	O2B-PB-O3B	3.46	116.62	107.27
2	A	701	T99	O2B-PB-O3A	3.42	116.52	107.27
2	L	702	T99	O2B-PB-O3B	2.99	115.37	107.27
2	J	703	T99	O2B-PB-O3A	2.67	114.49	107.27
2	D	701	T99	O2B-PB-O3A	2.34	113.60	107.27

There are no chirality outliers.

5 of 64 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701	T99	C4'-C5'-O5'-PA
2	B	701	T99	C4'-C5'-O5'-PA
2	D	701	T99	C4'-C5'-O5'-PA
2	E	701	T99	C4'-C5'-O5'-PA
2	F	702	T99	PB-O3B-PG-O3G

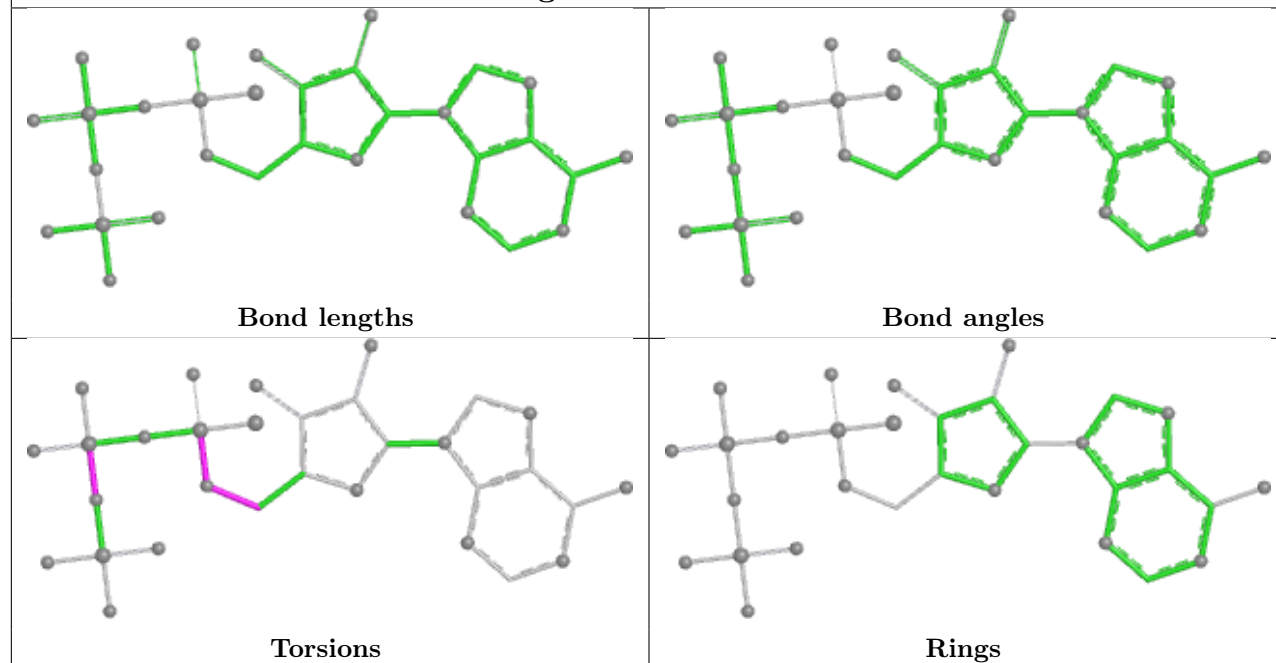
There are no ring outliers.

5 monomers are involved in 5 short contacts:

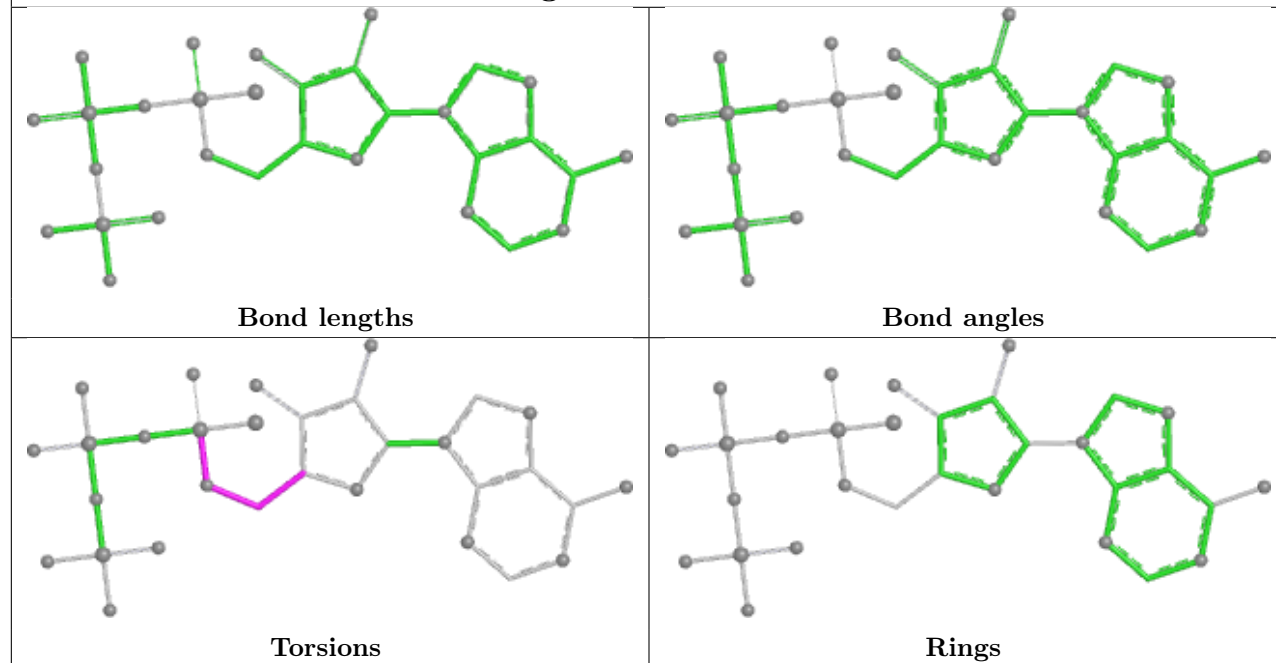
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	703	T99	1	0
2	F	702	T99	1	0
2	C	702	T99	1	0
2	O	701	T99	1	0
2	D	701	T99	1	0

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.

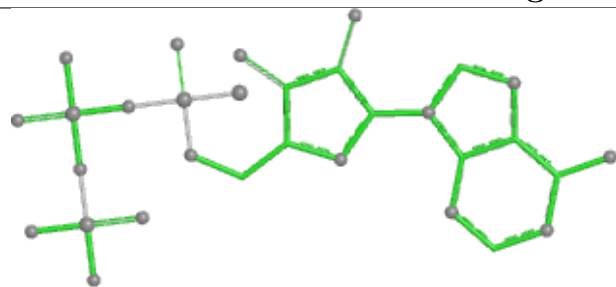
Ligand T99 H 701



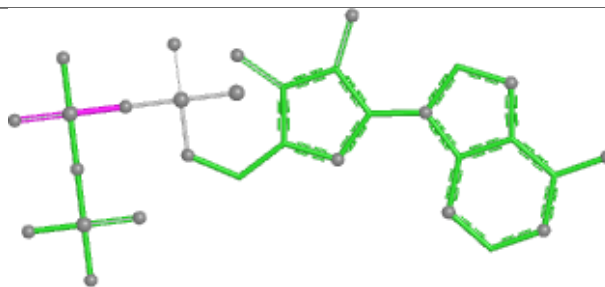
Ligand T99 E 701



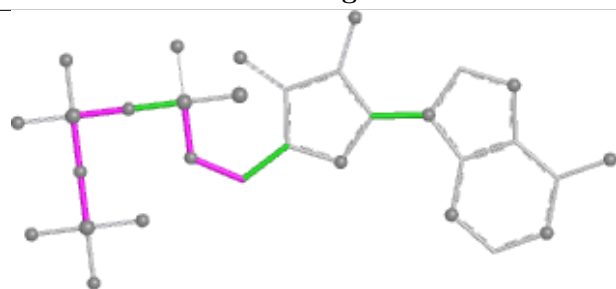
Ligand T99 J 703



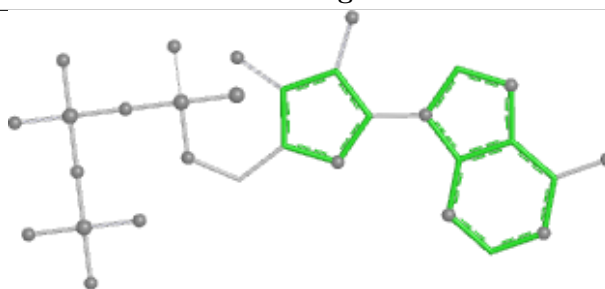
Bond lengths



Bond angles

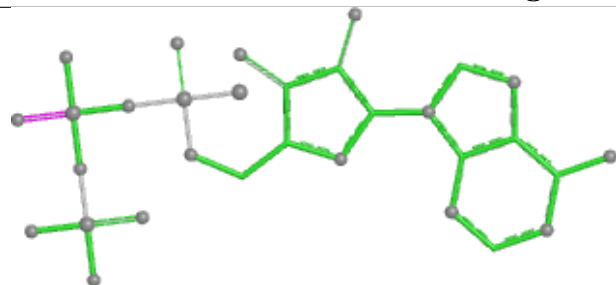


Torsions

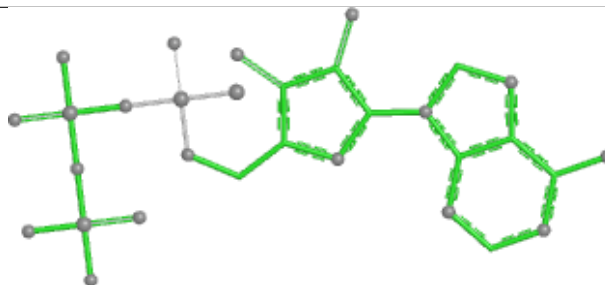


Rings

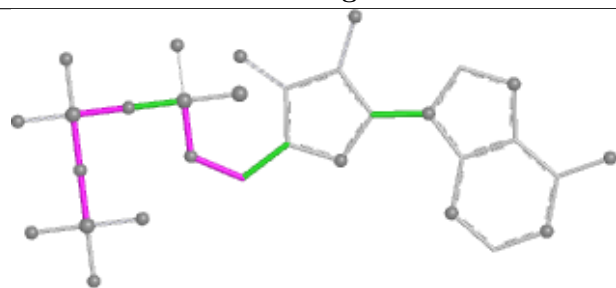
Ligand T99 F 702



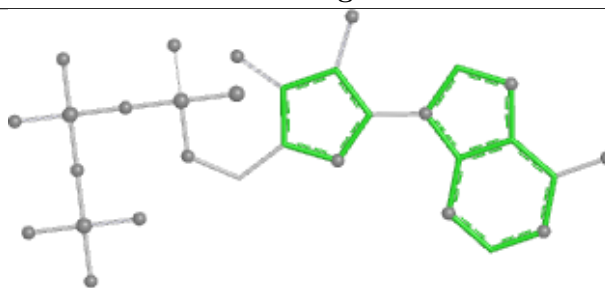
Bond lengths



Bond angles

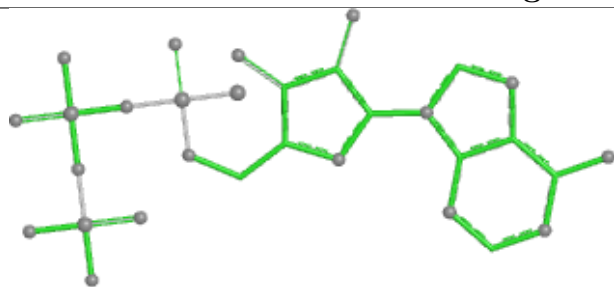


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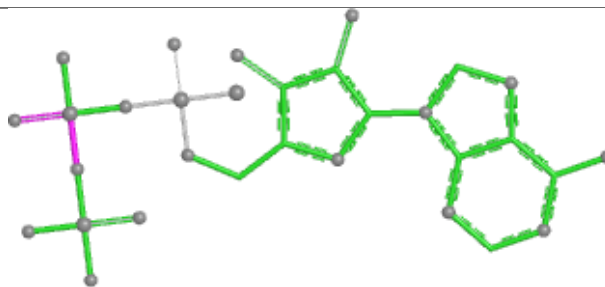


Rings

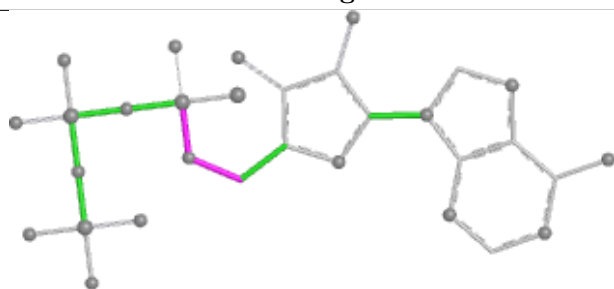
Ligand T99 L 702



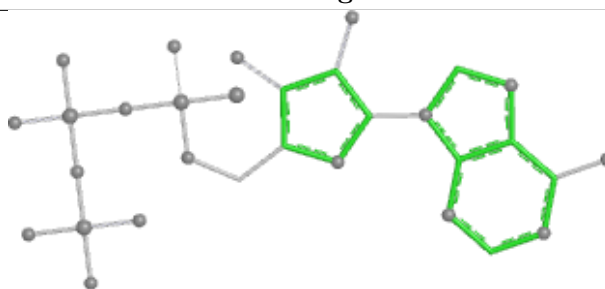
Bond lengths



Bond angles

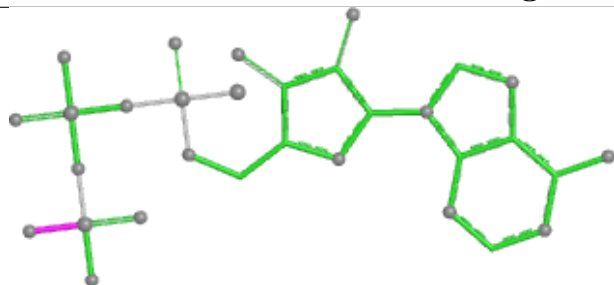


Torsions

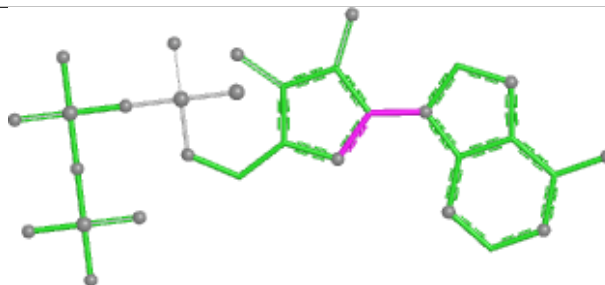


Rings

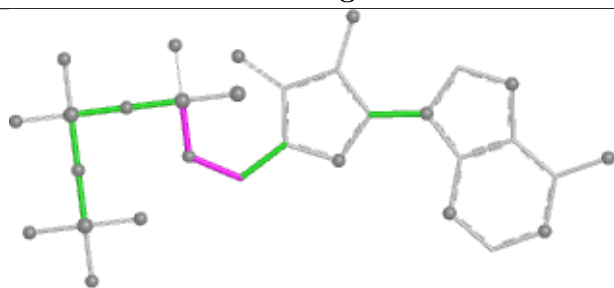
Ligand T99 C 702



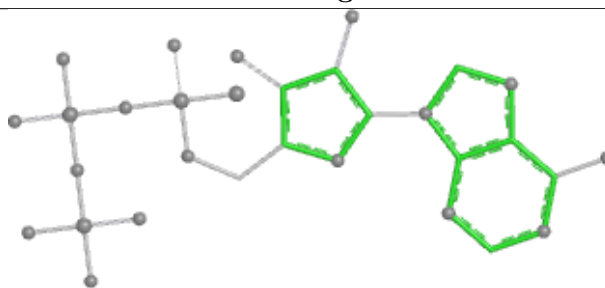
Bond lengths



Bond angles

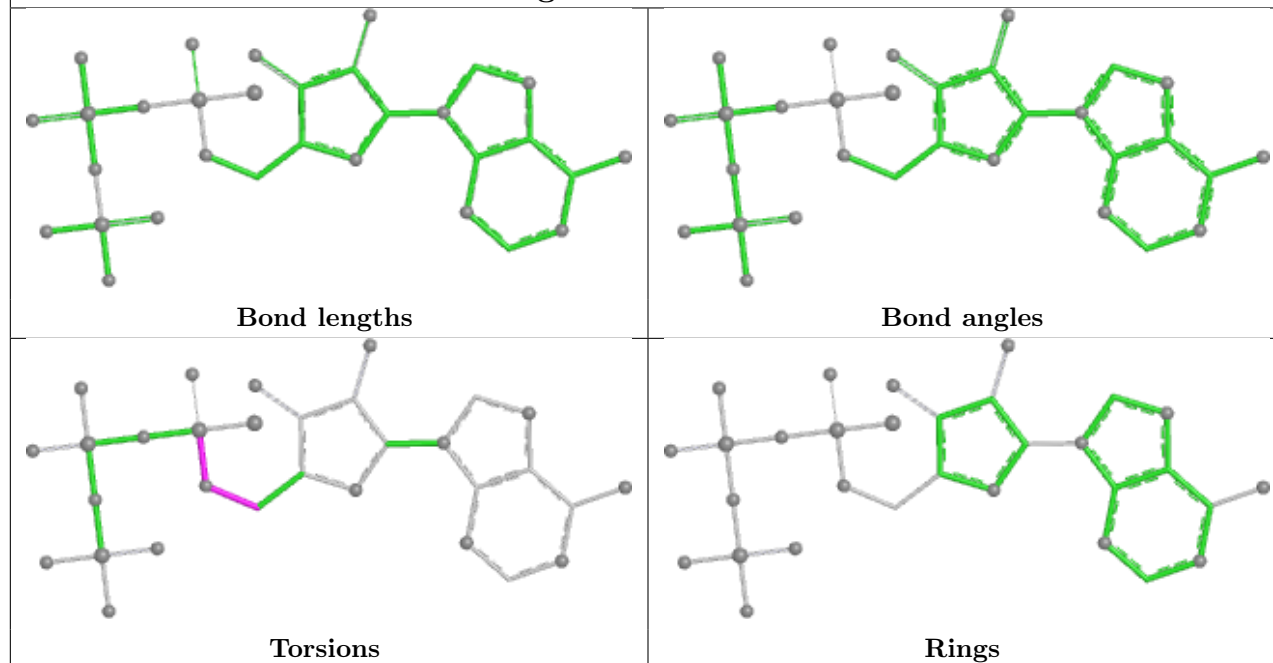


Torsions

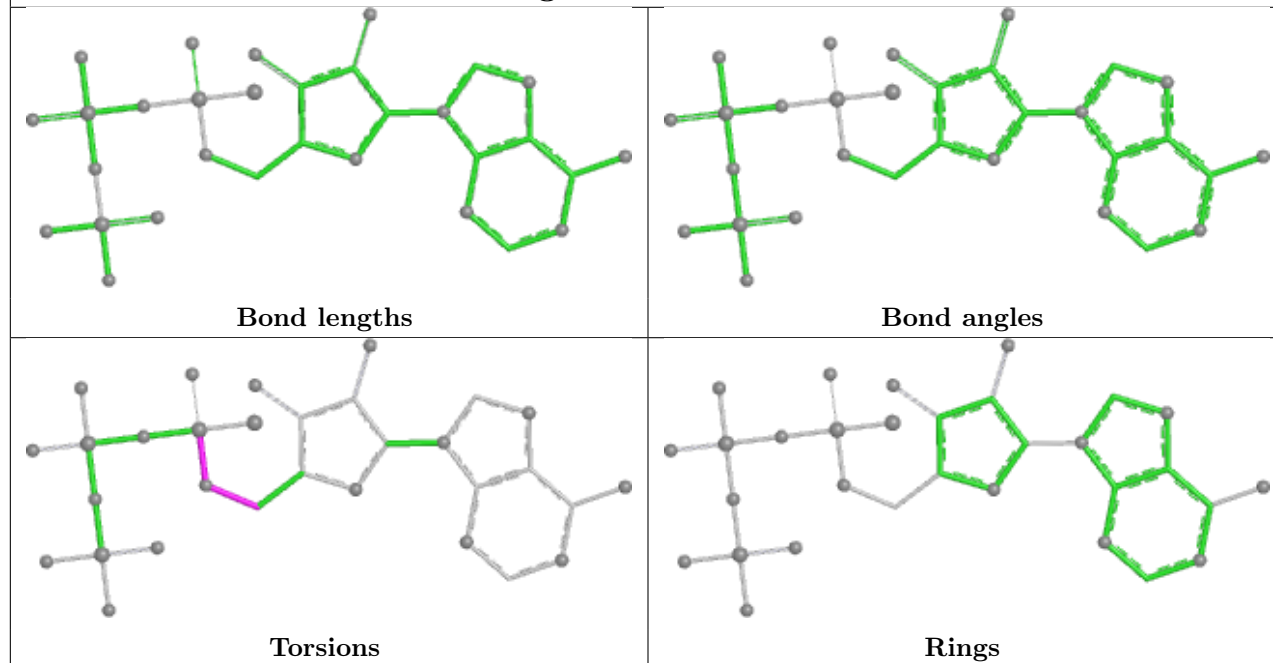


Rings

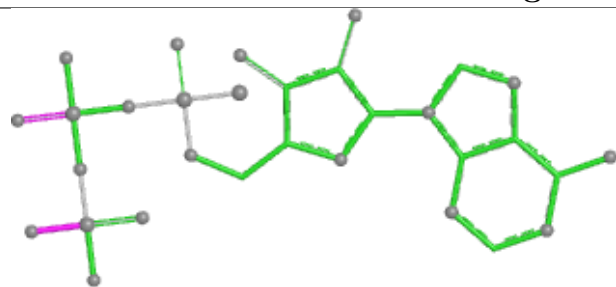
Ligand T99 O 701



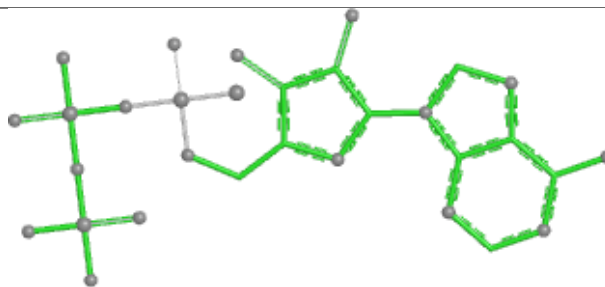
Ligand T99 B 701



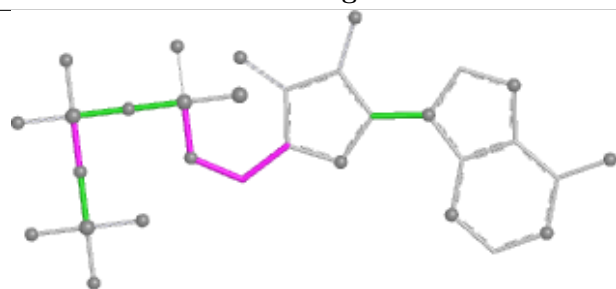
Ligand T99 P 701



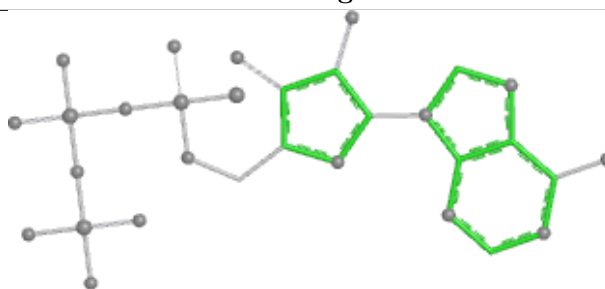
Bond lengths



Bond angles

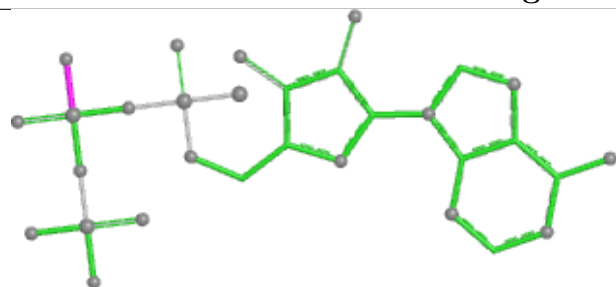


Torsions

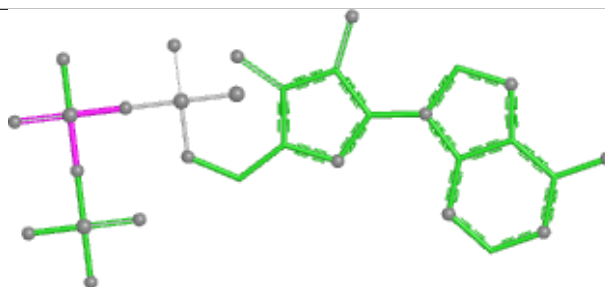


Rings

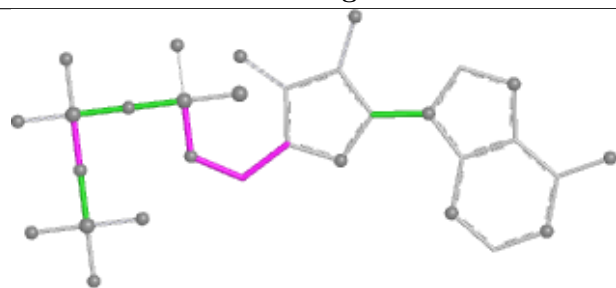
Ligand T99 A 701



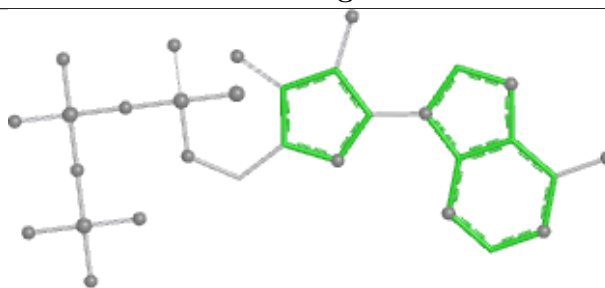
Bond lengths



Bond angles

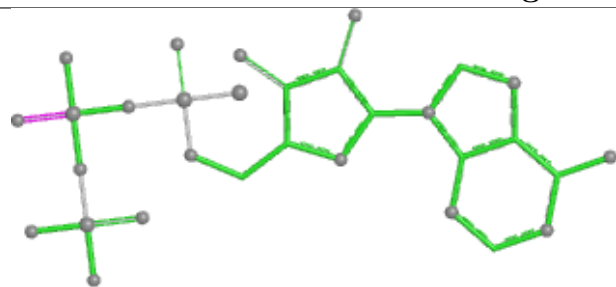


Torsions

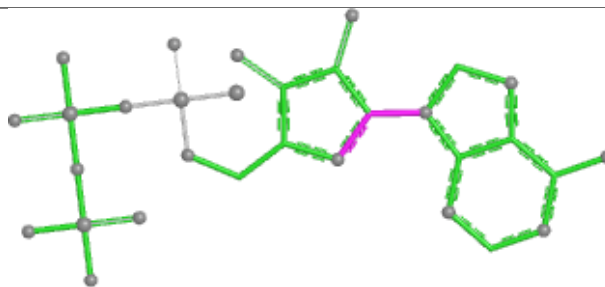


Rings

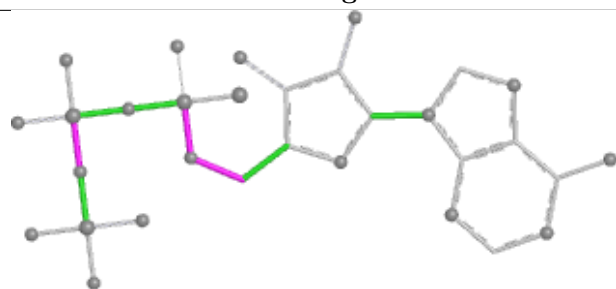
Ligand T99 G 701



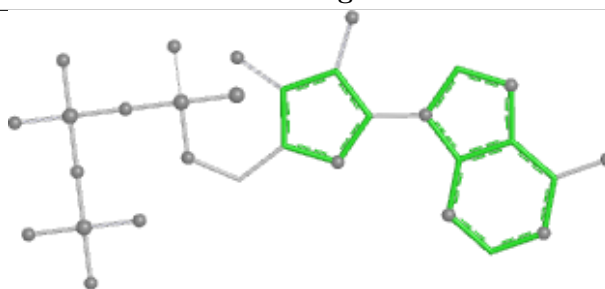
Bond lengths



Bond angles

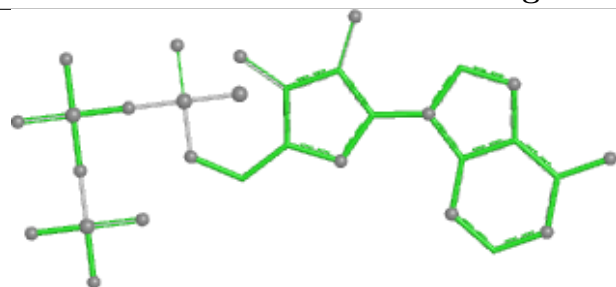


Torsions

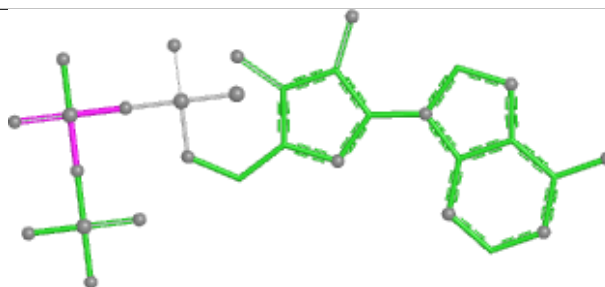


Rings

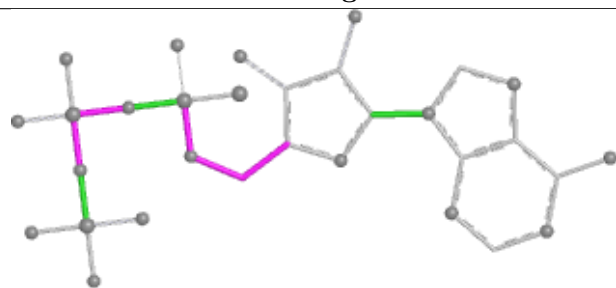
Ligand T99 D 701



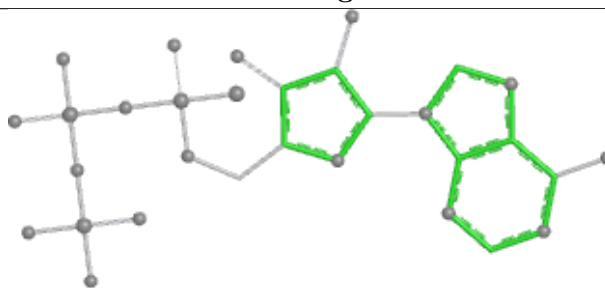
Bond lengths



Bond angles

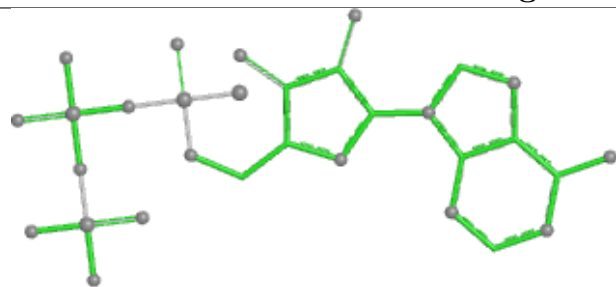


Torsions

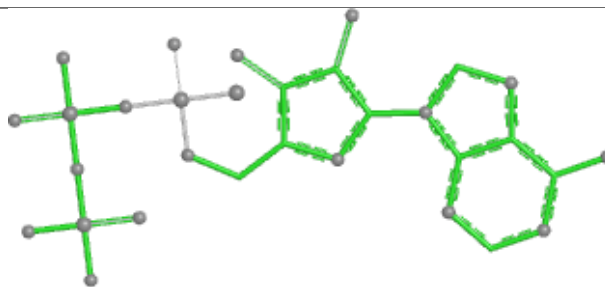


Rings

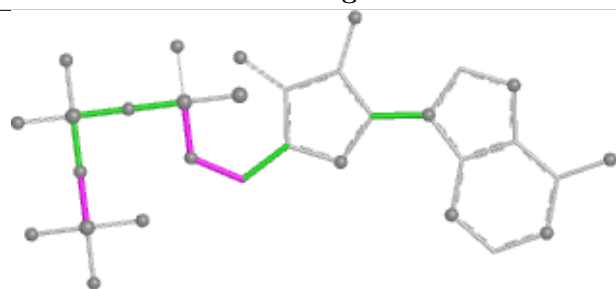
Ligand T99 M 701



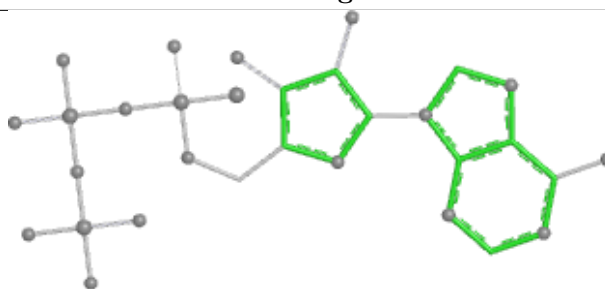
Bond lengths



Bond angles

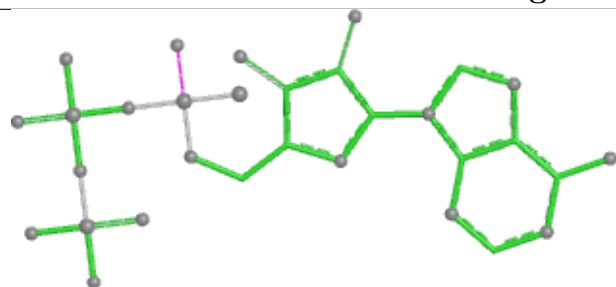


Torsions

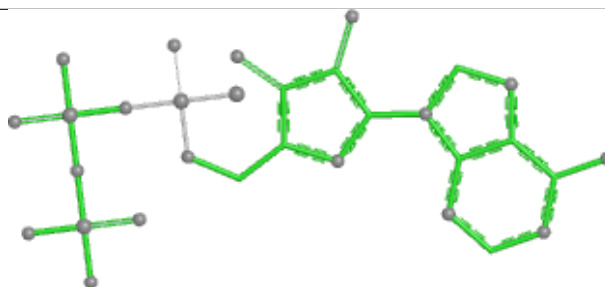


Rings

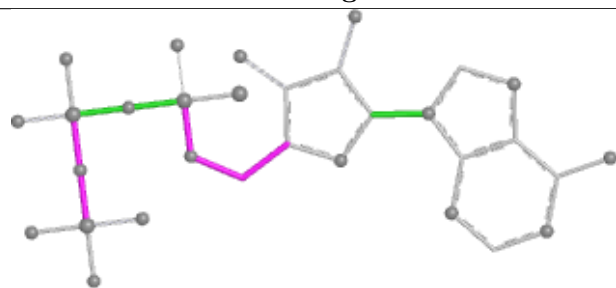
Ligand T99 I 702



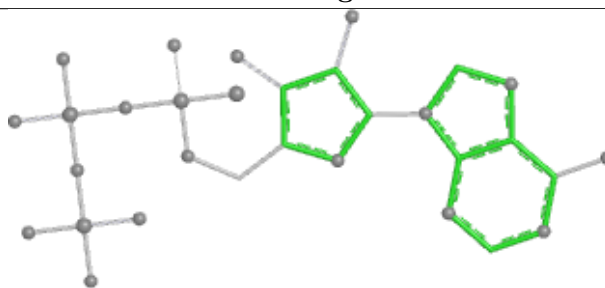
Bond lengths



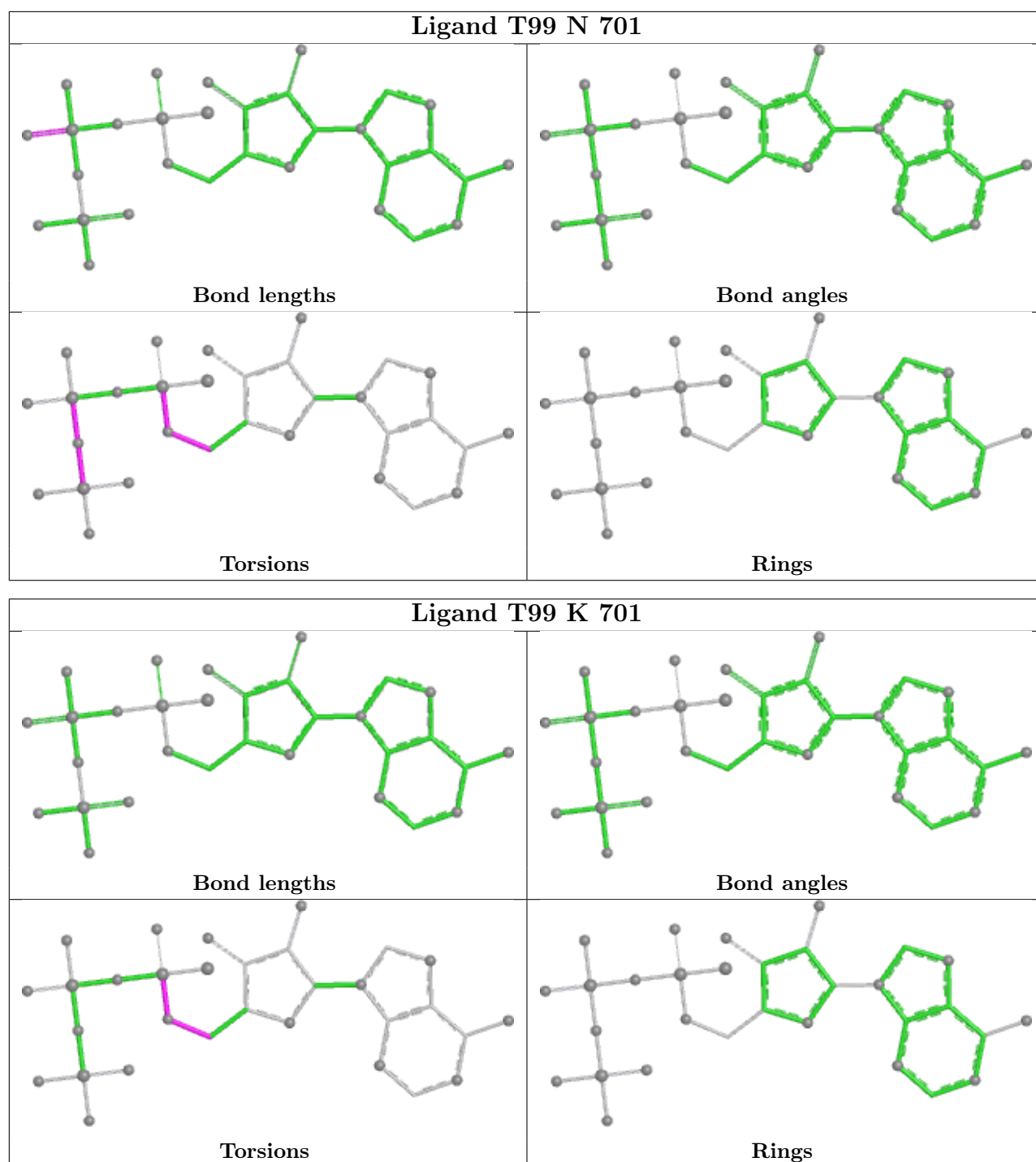
Bond angles



Torsions



Rings



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	184/193 (95%)	-0.06	12 (6%) 25 23	19, 36, 73, 100	0
1	B	184/193 (95%)	-0.49	4 (2%) 62 64	15, 28, 47, 78	0
1	C	184/193 (95%)	-0.24	8 (4%) 40 38	20, 33, 66, 97	0
1	D	185/193 (95%)	-0.59	5 (2%) 56 57	13, 23, 45, 92	0
1	E	182/193 (94%)	-0.11	8 (4%) 39 37	21, 37, 71, 96	0
1	F	185/193 (95%)	-0.38	2 (1%) 78 79	19, 32, 51, 97	0
1	G	185/193 (95%)	-0.21	10 (5%) 31 29	19, 34, 64, 98	0
1	H	185/193 (95%)	-0.61	4 (2%) 62 64	13, 22, 43, 77	0
1	I	182/193 (94%)	0.03	7 (3%) 44 43	25, 43, 73, 94	1 (0%)
1	J	185/193 (95%)	-0.36	3 (1%) 70 72	19, 32, 56, 82	1 (0%)
1	K	183/193 (94%)	0.62	15 (8%) 17 16	21, 56, 89, 104	0
1	L	185/193 (95%)	-0.51	4 (2%) 62 64	13, 26, 48, 80	0
1	M	180/193 (93%)	-0.22	7 (3%) 43 43	20, 36, 66, 93	0
1	N	181/193 (93%)	0.34	8 (4%) 39 37	30, 47, 75, 104	0
1	O	179/193 (92%)	0.10	7 (3%) 43 43	26, 45, 73, 83	0
1	P	179/193 (92%)	0.37	7 (3%) 43 43	30, 54, 86, 111	0
All	All	2928/3088 (94%)	-0.15	111 (3%) 44 43	13, 36, 73, 111	2 (0%)

The worst 5 of 111 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	443	THR	7.1
1	D	443	THR	7.0
1	P	563	PRO	6.2
1	B	443	THR	5.4
1	K	561	LEU	5.3

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, 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
4	GOL	J	701	6/6	0.87	0.13	57,63,64,64	0
4	GOL	D	702	6/6	0.88	0.12	45,52,53,53	0
4	GOL	K	703	6/6	0.88	0.13	53,63,73,76	0
2	T99	G	701	31/31	0.90	0.12	40,51,78,83	0
4	GOL	C	701	6/6	0.91	0.11	47,52,55,57	0
2	T99	I	702	31/31	0.91	0.11	38,63,88,91	0
2	T99	K	701	31/31	0.91	0.11	34,44,67,75	0
4	GOL	J	702	6/6	0.91	0.12	49,53,61,62	0
2	T99	N	701	31/31	0.91	0.11	51,57,80,83	0
2	T99	J	703	31/31	0.92	0.13	48,77,94,99	0
2	T99	O	701	31/31	0.92	0.11	54,74,84,88	0
4	GOL	A	704	6/6	0.92	0.10	56,56,59,59	0
2	T99	C	702	31/31	0.92	0.11	34,53,78,84	0
4	GOL	F	703	6/6	0.93	0.11	40,52,55,57	0
4	GOL	I	701	6/6	0.93	0.11	59,68,72,76	0
2	T99	M	701	31/31	0.93	0.10	45,52,79,84	0
2	T99	E	701	31/31	0.93	0.10	34,46,67,76	0
4	GOL	E	703	6/6	0.93	0.10	42,48,56,57	0
3	CA	N	702	1/1	0.94	0.06	46,46,46,46	0
4	GOL	F	701	6/6	0.94	0.09	46,47,51,53	0
4	GOL	A	703	6/6	0.94	0.10	40,44,46,46	0
2	T99	D	701	31/31	0.94	0.10	31,43,63,69	0
2	T99	H	701	31/31	0.94	0.11	32,49,74,85	0
4	GOL	C	704	6/6	0.94	0.10	37,48,49,51	0
2	T99	P	701	31/31	0.94	0.10	50,73,83,88	0
2	T99	L	702	31/31	0.95	0.09	42,51,64,71	0
4	GOL	G	703	6/6	0.95	0.10	36,41,45,46	0

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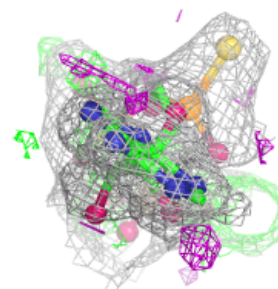
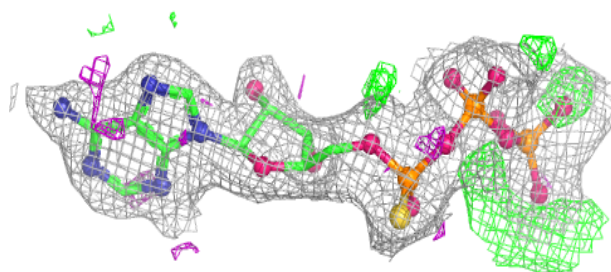
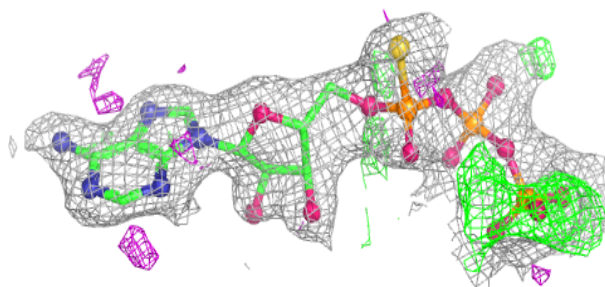
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	GOL	O	703	6/6	0.95	0.08	50,53,54,55	0
3	CA	O	702	1/1	0.96	0.06	50,50,50,50	0
2	T99	F	702	31/31	0.96	0.09	46,56,71,77	0
2	T99	B	701	31/31	0.96	0.08	39,49,67,72	0
3	CA	K	702	1/1	0.96	0.04	38,38,38,38	0
4	GOL	L	701	6/6	0.96	0.07	33,37,38,40	0
2	T99	A	701	31/31	0.96	0.07	28,38,58,59	0
3	CA	C	703	1/1	0.97	0.05	37,37,37,37	0
3	CA	I	703	1/1	0.97	0.04	46,46,46,46	0
3	CA	J	704	1/1	0.97	0.04	38,38,38,38	0
3	CA	G	702	1/1	0.98	0.03	35,35,35,35	0
3	CA	L	703	1/1	0.98	0.03	32,32,32,32	0
3	CA	E	702	1/1	0.98	0.04	38,38,38,38	0
3	CA	F	704	1/1	0.98	0.03	40,40,40,40	0
3	CA	P	702	1/1	0.98	0.04	52,52,52,52	0
3	CA	H	702	1/1	0.99	0.02	29,29,29,29	0
3	CA	M	702	1/1	0.99	0.03	42,42,42,42	0
3	CA	B	702	1/1	0.99	0.03	38,38,38,38	0
3	CA	A	702	1/1	0.99	0.03	34,34,34,34	0
3	CA	D	703	1/1	0.99	0.03	27,27,27,27	0

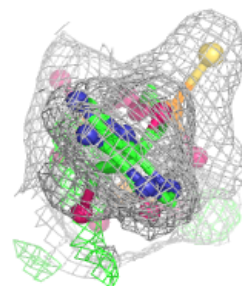
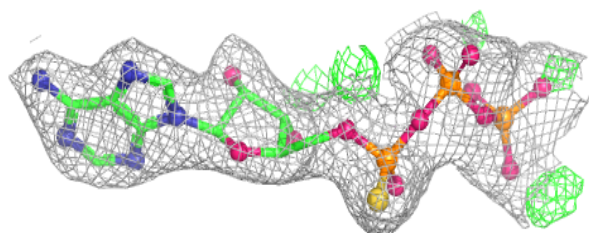
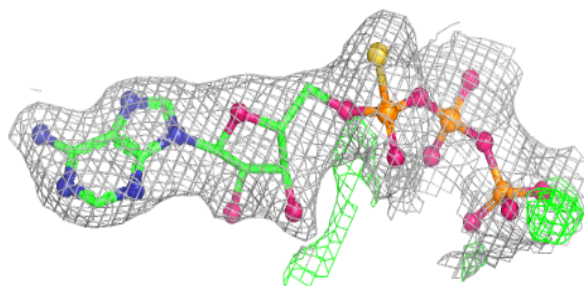
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around T99 G 701:

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

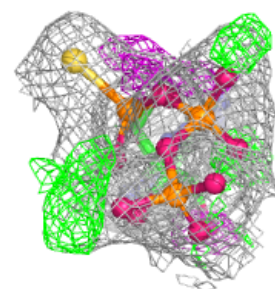
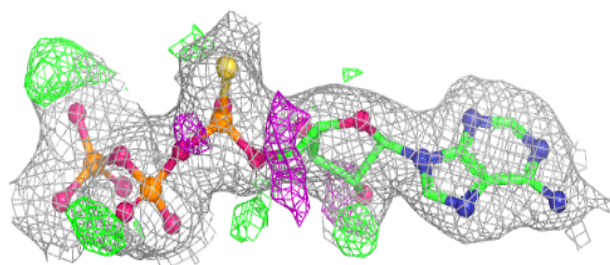
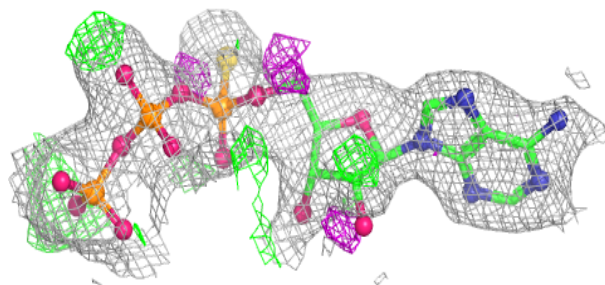
**Electron density around T99 I 702:**

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

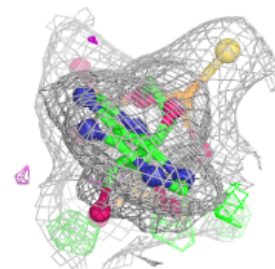
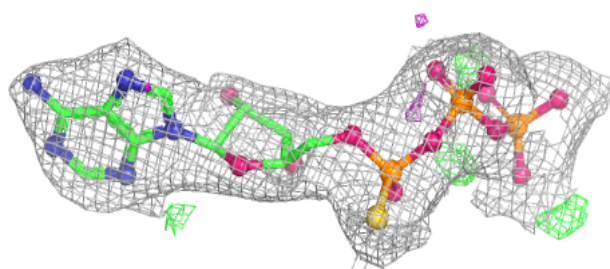
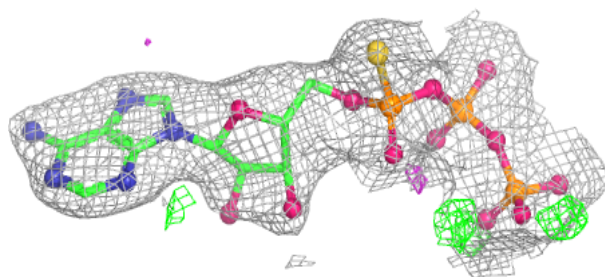


Electron density around T99 K 701:

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

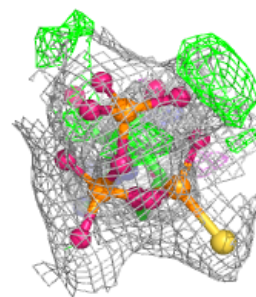
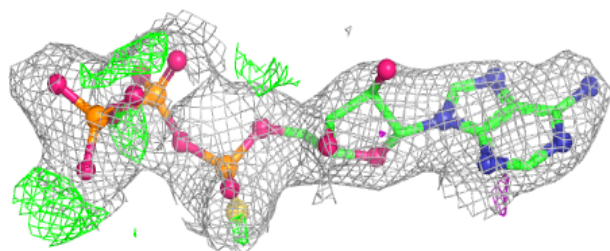
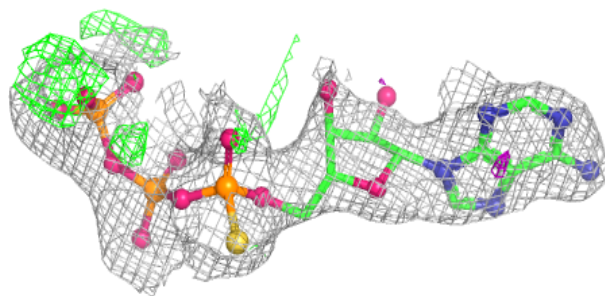
**Electron density around T99 N 701:**

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

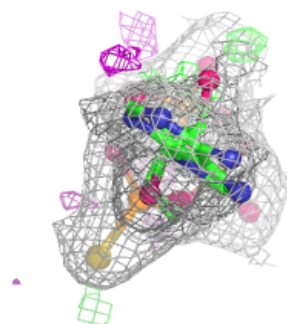
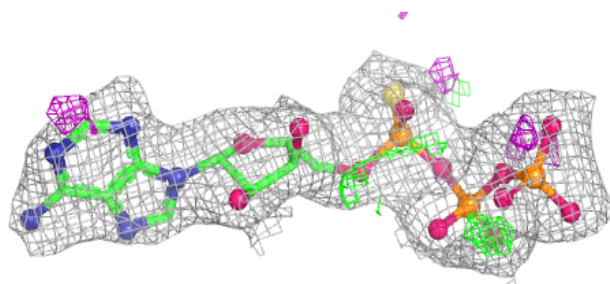
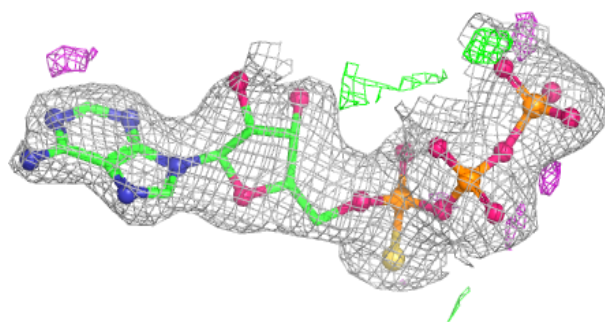


Electron density around T99 J 703:

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

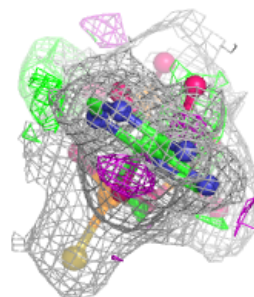
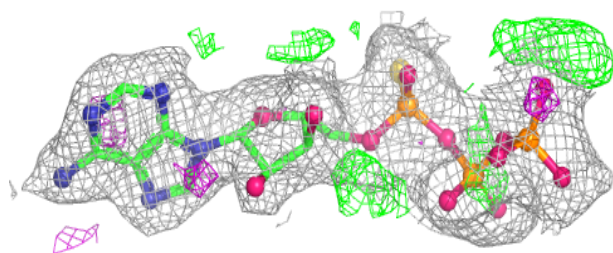
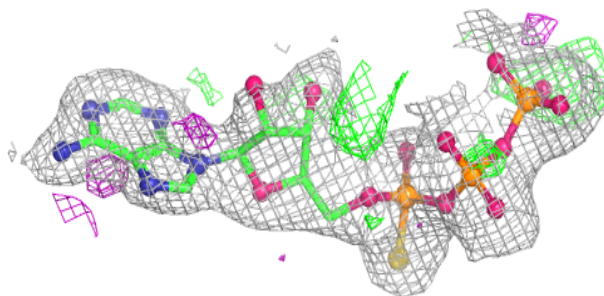
**Electron density around T99 O 701:**

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

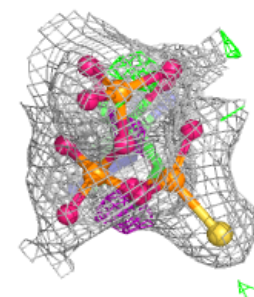
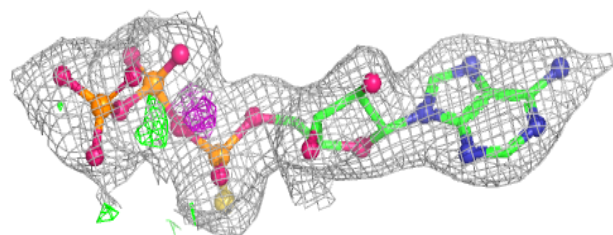
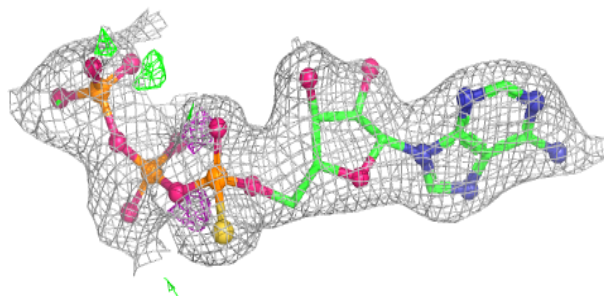


Electron density around T99 C 702:

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

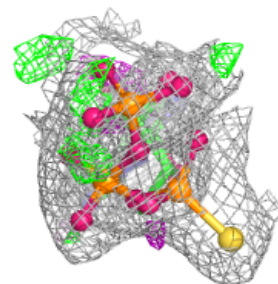
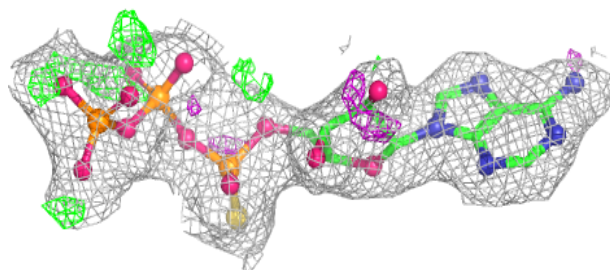
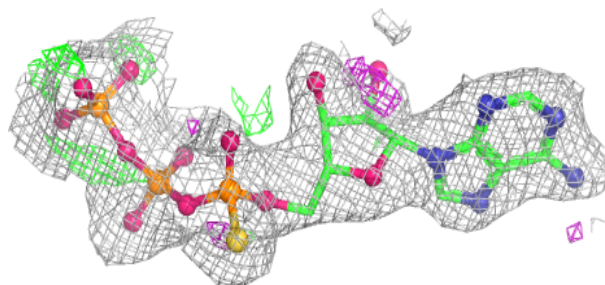
**Electron density around T99 M 701:**

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

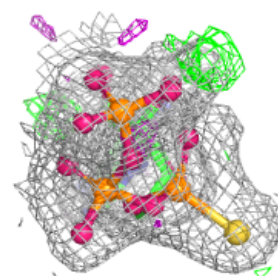
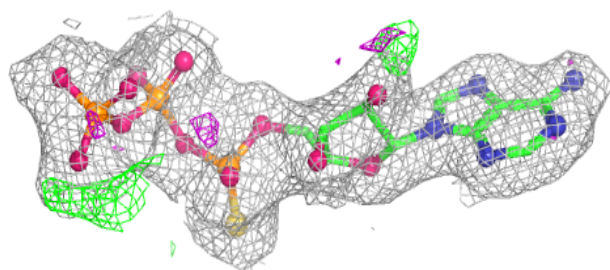
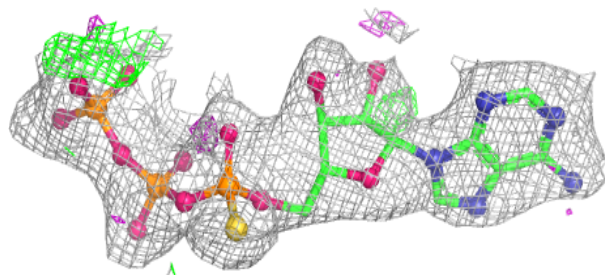


Electron density around T99 E 701:

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

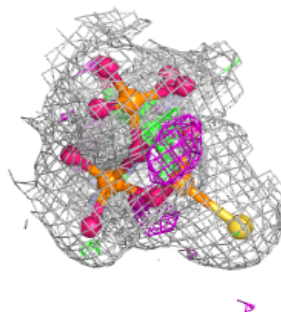
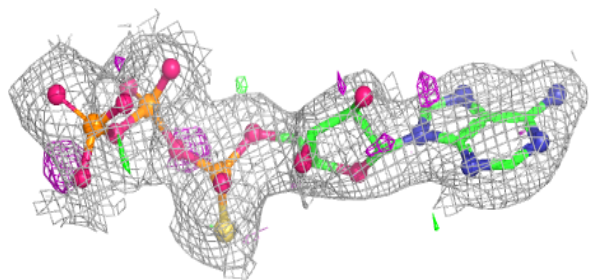
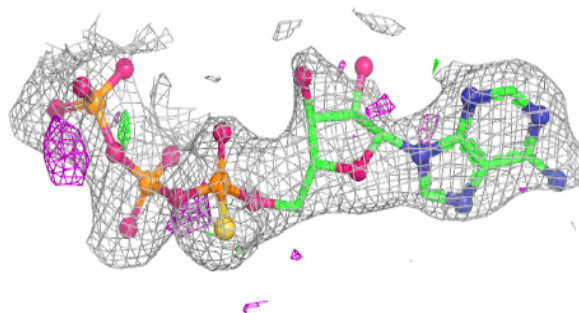
**Electron density around T99 D 701:**

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

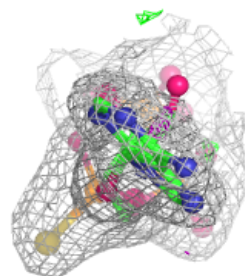
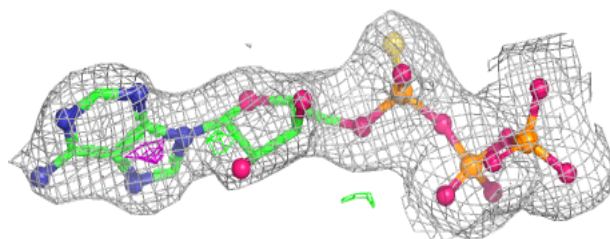
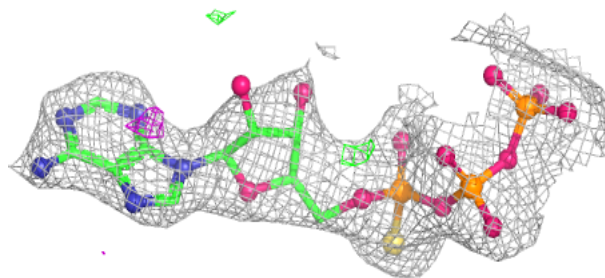


Electron density around T99 H 701:

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

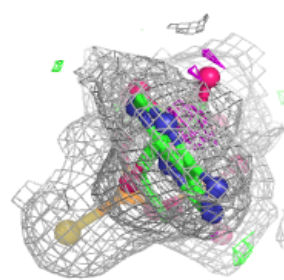
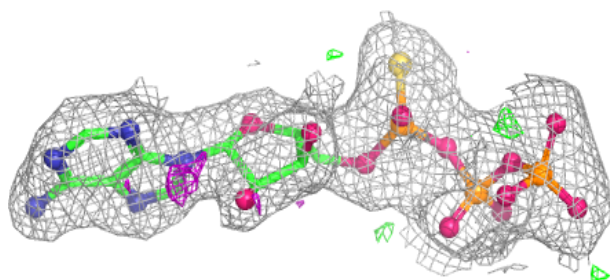
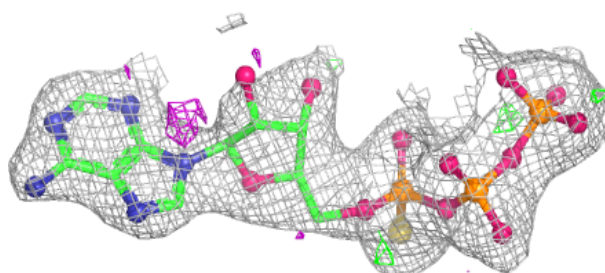
**Electron density around T99 P 701:**

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and green (positive)

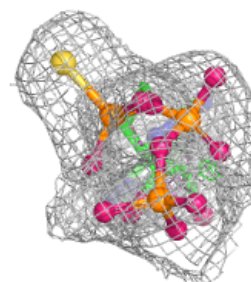
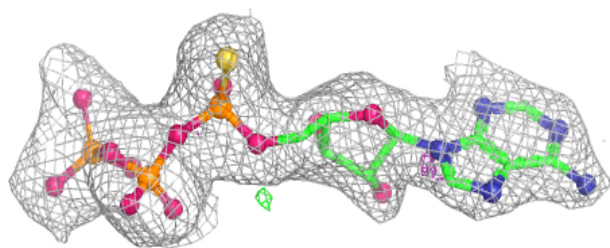
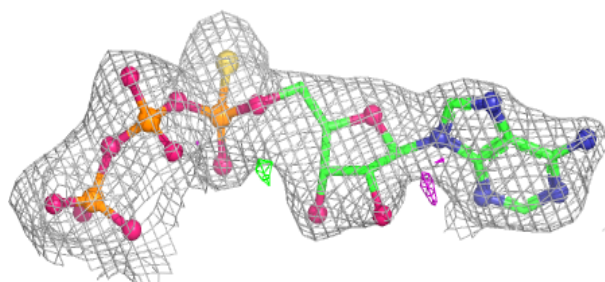


Electron density around T99 L 702:

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

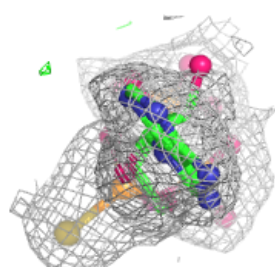
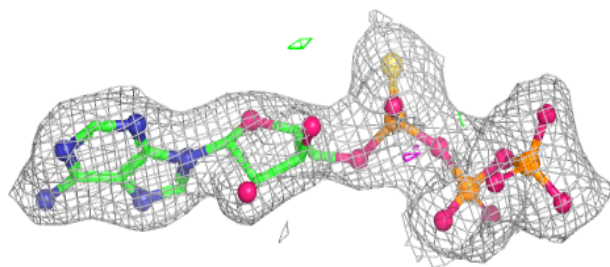
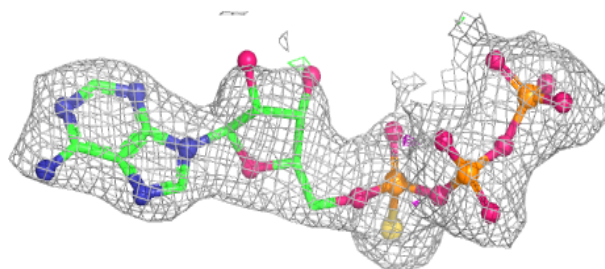
**Electron density around T99 F 702:**

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and green (positive)

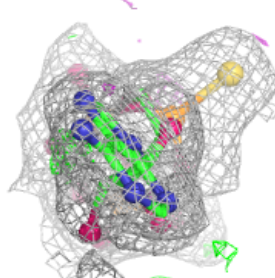
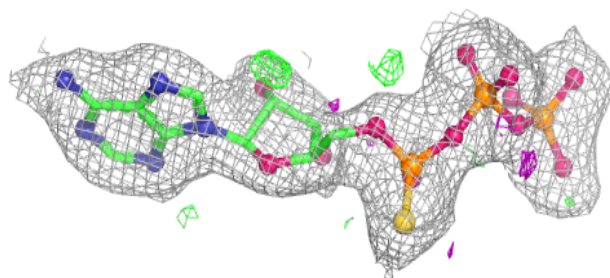
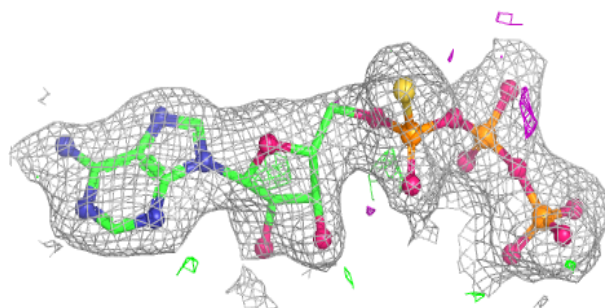


Electron density around T99 B 701:

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

**Electron density around T99 A 701:**

$2mF_o-DF_c$ (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.