



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2025 – 07:12 pm BST

PDB ID : 6T6G / pdb_00006t6g
Title : Bacteroides salyersiae GH164 beta-mannosidase in complex with noeuromycin
Authors : Armstrong, Z.; Davies, G.
Deposited on : 2019-10-18
Resolution : 2.06 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ 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 Phenix2.0rc1
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 2.0rc1
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

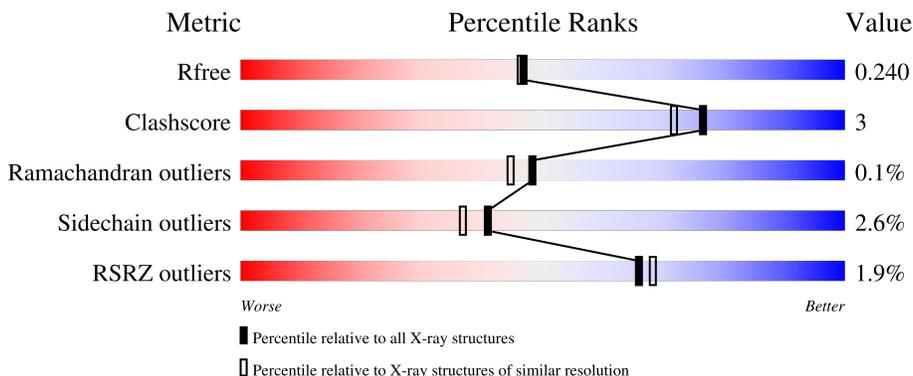
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.06 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}	164625	3436 (2.08-2.04)
Clashscore	180529	3661 (2.08-2.04)
Ramachandran outliers	177936	3649 (2.08-2.04)
Sidechain outliers	177891	3649 (2.08-2.04)
RSRZ outliers	164620	3436 (2.08-2.04)

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	AAA	674	 3% 87% 9% ..
1	BBB	674	 87% 9% .
1	CCC	674	 % 86% 9% ..
1	DDD	674	 4% 87% 9% ..
1	EEE	674	 % 87% 9% .

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Mol	Chain	Length	Quality of chain
1	FFF	674	 <p>A horizontal bar chart representing the quality of the chain. The bar is divided into three segments: a large green segment (87%), a smaller yellow segment (9%), and a very small grey segment (4%). A small red square is at the beginning of the bar, and a '%' symbol is above it. The values '87%' and '9%' are printed below the bar.</p>

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 63581 atoms, of which 30974 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 Glyco_hydro_42M domain-containing protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	AAA	655	10447	3409	5172	872	975	19	285	0	0
1	DDD	655	10435	3405	5168	871	972	19	283	0	0
1	CCC	650	10358	3378	5126	866	969	19	282	0	0
1	BBB	650	10361	3379	5128	866	969	19	283	0	0
1	FFF	651	10387	3387	5141	868	972	19	284	1	0
1	EEE	650	10354	3377	5125	865	968	19	281	0	0

There are 132 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AAA	10	MET	-	initiating methionine	UNP I9SUA3
AAA	11	GLY	-	expression tag	UNP I9SUA3
AAA	12	SER	-	expression tag	UNP I9SUA3
AAA	13	SER	-	expression tag	UNP I9SUA3
AAA	14	HIS	-	expression tag	UNP I9SUA3
AAA	15	HIS	-	expression tag	UNP I9SUA3
AAA	16	HIS	-	expression tag	UNP I9SUA3
AAA	17	HIS	-	expression tag	UNP I9SUA3
AAA	18	HIS	-	expression tag	UNP I9SUA3
AAA	19	HIS	-	expression tag	UNP I9SUA3
AAA	20	SER	-	expression tag	UNP I9SUA3
AAA	21	SER	-	expression tag	UNP I9SUA3
AAA	22	GLY	-	expression tag	UNP I9SUA3
AAA	23	LEU	-	expression tag	UNP I9SUA3
AAA	24	GLU	-	expression tag	UNP I9SUA3
AAA	25	VAL	-	expression tag	UNP I9SUA3
AAA	26	LEU	-	expression tag	UNP I9SUA3

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Chain	Residue	Modelled	Actual	Comment	Reference
AAA	27	PHE	-	expression tag	UNP I9SUA3
AAA	28	GLN	-	expression tag	UNP I9SUA3
AAA	29	GLY	-	expression tag	UNP I9SUA3
AAA	30	PRO	-	expression tag	UNP I9SUA3
AAA	31	ALA	-	expression tag	UNP I9SUA3
DDD	10	MET	-	initiating methionine	UNP I9SUA3
DDD	11	GLY	-	expression tag	UNP I9SUA3
DDD	12	SER	-	expression tag	UNP I9SUA3
DDD	13	SER	-	expression tag	UNP I9SUA3
DDD	14	HIS	-	expression tag	UNP I9SUA3
DDD	15	HIS	-	expression tag	UNP I9SUA3
DDD	16	HIS	-	expression tag	UNP I9SUA3
DDD	17	HIS	-	expression tag	UNP I9SUA3
DDD	18	HIS	-	expression tag	UNP I9SUA3
DDD	19	HIS	-	expression tag	UNP I9SUA3
DDD	20	SER	-	expression tag	UNP I9SUA3
DDD	21	SER	-	expression tag	UNP I9SUA3
DDD	22	GLY	-	expression tag	UNP I9SUA3
DDD	23	LEU	-	expression tag	UNP I9SUA3
DDD	24	GLU	-	expression tag	UNP I9SUA3
DDD	25	VAL	-	expression tag	UNP I9SUA3
DDD	26	LEU	-	expression tag	UNP I9SUA3
DDD	27	PHE	-	expression tag	UNP I9SUA3
DDD	28	GLN	-	expression tag	UNP I9SUA3
DDD	29	GLY	-	expression tag	UNP I9SUA3
DDD	30	PRO	-	expression tag	UNP I9SUA3
DDD	31	ALA	-	expression tag	UNP I9SUA3
CCC	10	MET	-	initiating methionine	UNP I9SUA3
CCC	11	GLY	-	expression tag	UNP I9SUA3
CCC	12	SER	-	expression tag	UNP I9SUA3
CCC	13	SER	-	expression tag	UNP I9SUA3
CCC	14	HIS	-	expression tag	UNP I9SUA3
CCC	15	HIS	-	expression tag	UNP I9SUA3
CCC	16	HIS	-	expression tag	UNP I9SUA3
CCC	17	HIS	-	expression tag	UNP I9SUA3
CCC	18	HIS	-	expression tag	UNP I9SUA3
CCC	19	HIS	-	expression tag	UNP I9SUA3
CCC	20	SER	-	expression tag	UNP I9SUA3
CCC	21	SER	-	expression tag	UNP I9SUA3
CCC	22	GLY	-	expression tag	UNP I9SUA3
CCC	23	LEU	-	expression tag	UNP I9SUA3
CCC	24	GLU	-	expression tag	UNP I9SUA3

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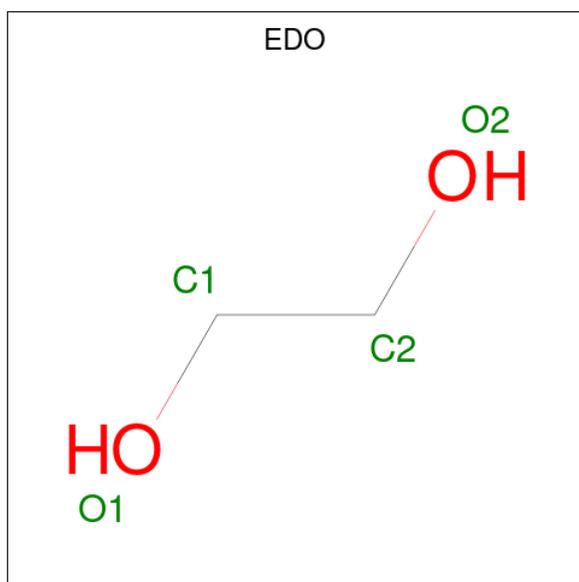
Chain	Residue	Modelled	Actual	Comment	Reference
CCC	25	VAL	-	expression tag	UNP I9SUA3
CCC	26	LEU	-	expression tag	UNP I9SUA3
CCC	27	PHE	-	expression tag	UNP I9SUA3
CCC	28	GLN	-	expression tag	UNP I9SUA3
CCC	29	GLY	-	expression tag	UNP I9SUA3
CCC	30	PRO	-	expression tag	UNP I9SUA3
CCC	31	ALA	-	expression tag	UNP I9SUA3
BBB	10	MET	-	initiating methionine	UNP I9SUA3
BBB	11	GLY	-	expression tag	UNP I9SUA3
BBB	12	SER	-	expression tag	UNP I9SUA3
BBB	13	SER	-	expression tag	UNP I9SUA3
BBB	14	HIS	-	expression tag	UNP I9SUA3
BBB	15	HIS	-	expression tag	UNP I9SUA3
BBB	16	HIS	-	expression tag	UNP I9SUA3
BBB	17	HIS	-	expression tag	UNP I9SUA3
BBB	18	HIS	-	expression tag	UNP I9SUA3
BBB	19	HIS	-	expression tag	UNP I9SUA3
BBB	20	SER	-	expression tag	UNP I9SUA3
BBB	21	SER	-	expression tag	UNP I9SUA3
BBB	22	GLY	-	expression tag	UNP I9SUA3
BBB	23	LEU	-	expression tag	UNP I9SUA3
BBB	24	GLU	-	expression tag	UNP I9SUA3
BBB	25	VAL	-	expression tag	UNP I9SUA3
BBB	26	LEU	-	expression tag	UNP I9SUA3
BBB	27	PHE	-	expression tag	UNP I9SUA3
BBB	28	GLN	-	expression tag	UNP I9SUA3
BBB	29	GLY	-	expression tag	UNP I9SUA3
BBB	30	PRO	-	expression tag	UNP I9SUA3
BBB	31	ALA	-	expression tag	UNP I9SUA3
FFF	10	MET	-	initiating methionine	UNP I9SUA3
FFF	11	GLY	-	expression tag	UNP I9SUA3
FFF	12	SER	-	expression tag	UNP I9SUA3
FFF	13	SER	-	expression tag	UNP I9SUA3
FFF	14	HIS	-	expression tag	UNP I9SUA3
FFF	15	HIS	-	expression tag	UNP I9SUA3
FFF	16	HIS	-	expression tag	UNP I9SUA3
FFF	17	HIS	-	expression tag	UNP I9SUA3
FFF	18	HIS	-	expression tag	UNP I9SUA3
FFF	19	HIS	-	expression tag	UNP I9SUA3
FFF	20	SER	-	expression tag	UNP I9SUA3
FFF	21	SER	-	expression tag	UNP I9SUA3
FFF	22	GLY	-	expression tag	UNP I9SUA3

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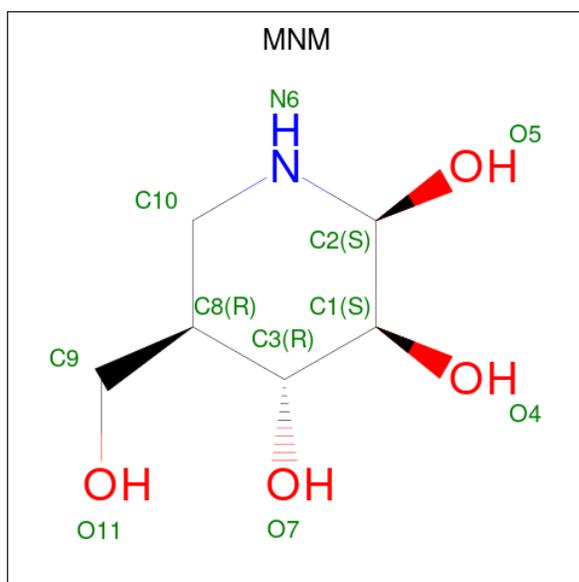
Chain	Residue	Modelled	Actual	Comment	Reference
FFF	23	LEU	-	expression tag	UNP I9SUA3
FFF	24	GLU	-	expression tag	UNP I9SUA3
FFF	25	VAL	-	expression tag	UNP I9SUA3
FFF	26	LEU	-	expression tag	UNP I9SUA3
FFF	27	PHE	-	expression tag	UNP I9SUA3
FFF	28	GLN	-	expression tag	UNP I9SUA3
FFF	29	GLY	-	expression tag	UNP I9SUA3
FFF	30	PRO	-	expression tag	UNP I9SUA3
FFF	31	ALA	-	expression tag	UNP I9SUA3
EEE	10	MET	-	initiating methionine	UNP I9SUA3
EEE	11	GLY	-	expression tag	UNP I9SUA3
EEE	12	SER	-	expression tag	UNP I9SUA3
EEE	13	SER	-	expression tag	UNP I9SUA3
EEE	14	HIS	-	expression tag	UNP I9SUA3
EEE	15	HIS	-	expression tag	UNP I9SUA3
EEE	16	HIS	-	expression tag	UNP I9SUA3
EEE	17	HIS	-	expression tag	UNP I9SUA3
EEE	18	HIS	-	expression tag	UNP I9SUA3
EEE	19	HIS	-	expression tag	UNP I9SUA3
EEE	20	SER	-	expression tag	UNP I9SUA3
EEE	21	SER	-	expression tag	UNP I9SUA3
EEE	22	GLY	-	expression tag	UNP I9SUA3
EEE	23	LEU	-	expression tag	UNP I9SUA3
EEE	24	GLU	-	expression tag	UNP I9SUA3
EEE	25	VAL	-	expression tag	UNP I9SUA3
EEE	26	LEU	-	expression tag	UNP I9SUA3
EEE	27	PHE	-	expression tag	UNP I9SUA3
EEE	28	GLN	-	expression tag	UNP I9SUA3
EEE	29	GLY	-	expression tag	UNP I9SUA3
EEE	30	PRO	-	expression tag	UNP I9SUA3
EEE	31	ALA	-	expression tag	UNP I9SUA3

- Molecule 2 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
2	AAA	1	10	2	6	2	1	0
2	DDD	1	10	2	6	2	1	0
2	CCC	1	10	2	6	2	1	0
2	BBB	1	10	2	6	2	1	0
2	FFF	1	10	2	6	2	1	0
2	EEE	1	10	2	6	2	1	0

- Molecule 3 is (2S,3S,4R,5R)-2,3,4-TRIHIDROXY-5-HYDROXYMETHYL-PIPERIDINE (CCD ID: MNM) (formula: C₆H₁₃NO₄) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	H	N			O
3	AAA	1	24	6	13	1	4	3	0
3	DDD	1	24	6	13	1	4	3	0
3	CCC	1	24	6	13	1	4	3	0
3	BBB	1	24	6	13	1	4	3	0
3	FFF	1	24	6	13	1	4	3	0
3	EEE	1	24	6	13	1	4	3	0

- Molecule 4 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Cl		
4	AAA	1	1	1	0	0
4	DDD	1	1	1	0	0
4	CCC	1	1	1	0	0
4	BBB	1	1	1	0	0
4	FFF	1	1	1	0	0
4	EEE	1	1	1	0	0

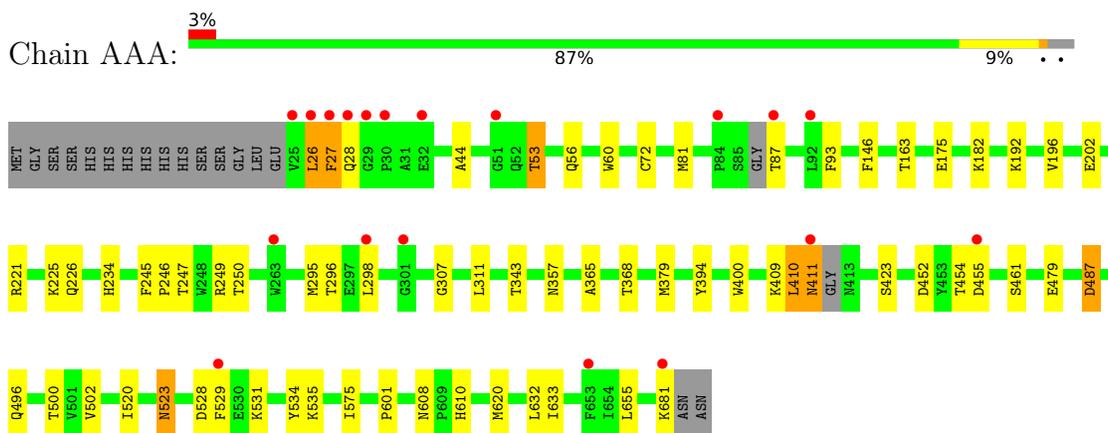
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	AAA	168	Total O 168 168	0	0
5	DDD	131	Total O 131 131	0	0
5	CCC	160	Total O 160 160	0	0
5	BBB	212	Total O 212 212	0	0
5	FFF	228	Total O 228 228	0	0
5	EEE	130	Total O 130 130	0	0

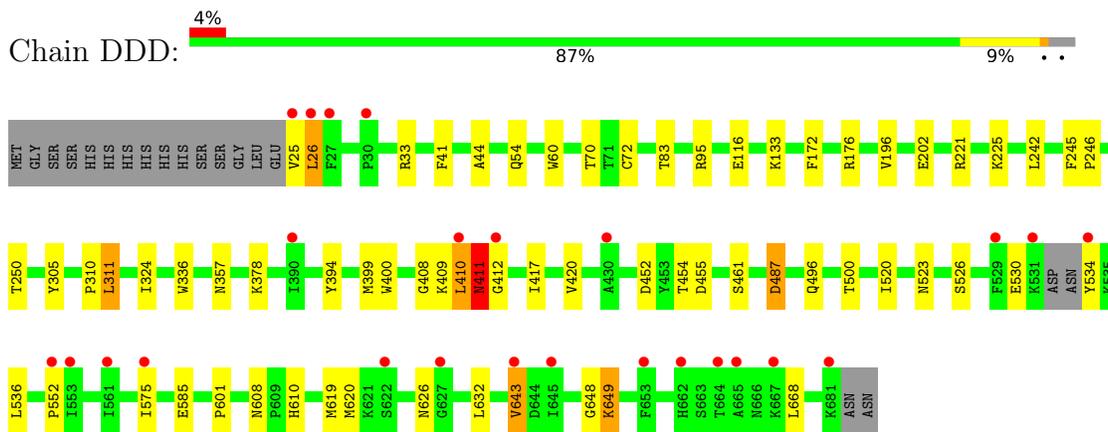
3 Residue-property plots [i](#)

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.

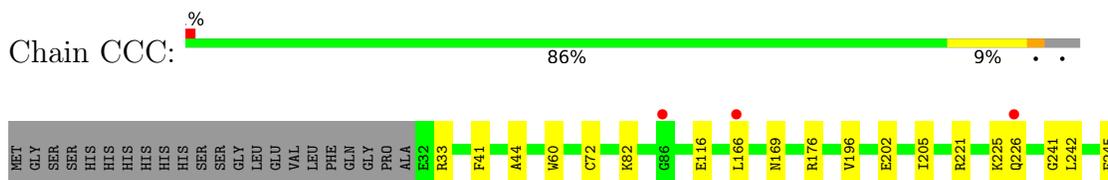
- Molecule 1: Glyco_hydro_42M domain-containing protein

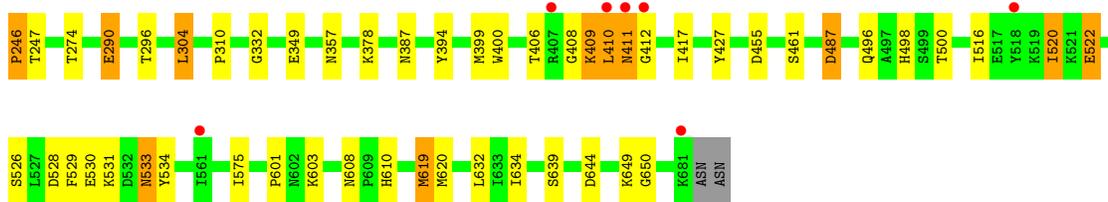


- Molecule 1: Glyco_hydro_42M domain-containing protein

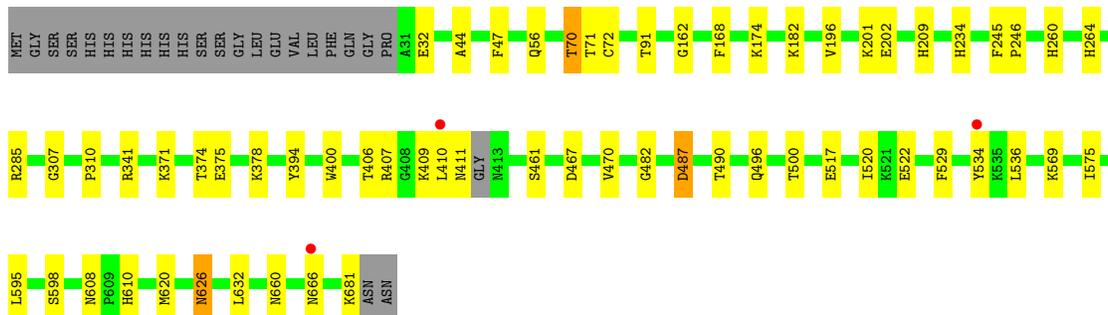


- Molecule 1: Glyco_hydro_42M domain-containing protein

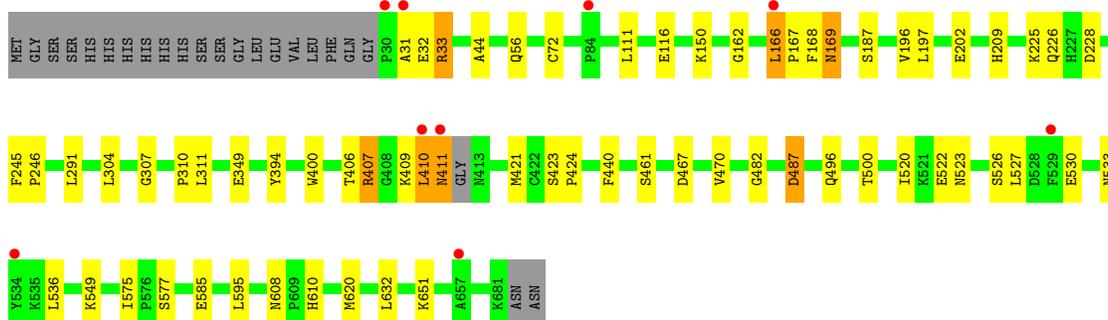
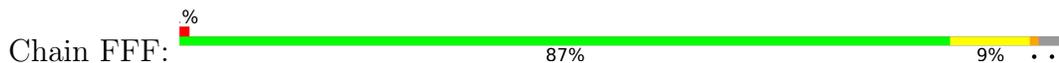




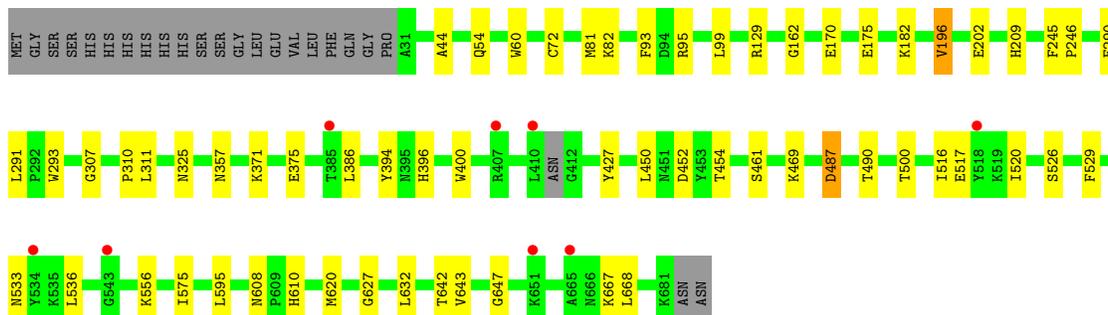
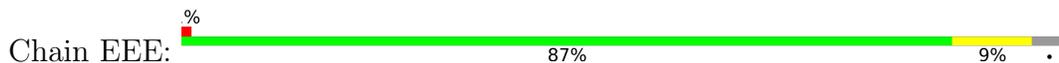
• Molecule 1: Glyco_hydro_42M domain-containing protein



• Molecule 1: Glyco_hydro_42M domain-containing protein



• Molecule 1: Glyco_hydro_42M domain-containing protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	69.75Å 105.10Å 170.54Å 92.60° 97.21° 105.10°	Depositor
Resolution (Å)	90.19 – 2.06 90.19 – 2.06	Depositor EDS
% Data completeness (in resolution range)	98.2 (90.19-2.06) 98.2 (90.19-2.06)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.02 (at 2.07Å)	Xtrriage
Refinement program	REFMAC 5.8.0257	Depositor
R, R_{free}	0.212 , 0.240 0.212 , 0.240	Depositor DCC
R_{free} test set	13971 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	31.0	Xtrriage
Anisotropy	0.687	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 27.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	63581	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.71% of the height of the origin peak. No significant pseudotranslation is detected.*

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: CL, EDO, MNM

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	AAA	1.10	4/5419 (0.1%)	1.33	17/7334 (0.2%)
1	BBB	1.12	5/5376 (0.1%)	1.34	16/7276 (0.2%)
1	CCC	1.10	2/5376 (0.0%)	1.34	15/7277 (0.2%)
1	DDD	1.08	2/5412 (0.0%)	1.32	7/7325 (0.1%)
1	EEE	1.10	4/5372 (0.1%)	1.31	9/7270 (0.1%)
1	FFF	1.09	1/5390 (0.0%)	1.31	9/7295 (0.1%)
All	All	1.10	18/32345 (0.1%)	1.33	73/43777 (0.2%)

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	EEE	627	GLY	C-O	-16.18	1.02	1.23
1	BBB	234	HIS	CE1-NE2	6.64	1.39	1.32
1	AAA	234	HIS	CE1-NE2	6.57	1.39	1.32
1	DDD	305	TYR	C-O	-5.82	1.16	1.24
1	EEE	490	THR	C-O	5.81	1.30	1.23
1	EEE	396	HIS	CE1-NE2	5.75	1.38	1.32
1	CCC	246	PRO	C-O	-5.64	1.16	1.24
1	FFF	111	LEU	C-O	5.47	1.30	1.24
1	BBB	626	ASN	C-O	5.47	1.29	1.24
1	BBB	490	THR	C-O	5.38	1.30	1.23
1	AAA	53	THR	C-O	5.35	1.30	1.23
1	EEE	386	LEU	C-O	5.27	1.30	1.23
1	CCC	387	ASN	C-O	-5.20	1.17	1.24
1	DDD	552	PRO	C-O	-5.17	1.18	1.23
1	AAA	423	SER	N-CA	5.13	1.50	1.46
1	BBB	264	HIS	CE1-NE2	5.12	1.37	1.32
1	BBB	260	HIS	CE1-NE2	5.05	1.37	1.32
1	AAA	502	VAL	C-O	-5.03	1.18	1.23

All (73) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	CCC	644	ASP	CA-CB-CG	10.35	122.95	112.60
1	CCC	169	ASN	CA-CB-CG	-9.41	103.19	112.60
1	EEE	170	GLU	CB-CA-C	8.61	121.92	109.26
1	AAA	226	GLN	CB-CG-CD	-7.80	99.34	112.60
1	CCC	412	GLY	CA-C-N	7.58	132.20	120.75
1	CCC	412	GLY	C-N-CA	7.58	132.20	120.75
1	DDD	412	GLY	CA-C-N	7.11	131.49	120.75
1	DDD	412	GLY	C-N-CA	7.11	131.49	120.75
1	AAA	163	THR	OG1-CB-CG2	6.81	122.92	109.30
1	CCC	410	LEU	CA-C-N	6.62	134.18	121.54
1	CCC	410	LEU	C-N-CA	6.62	134.18	121.54
1	BBB	91	THR	CB-CA-C	6.59	121.73	110.79
1	DDD	500	THR	N-CA-C	-6.46	105.36	113.18
1	FFF	394	TYR	CA-C-O	-6.25	114.15	121.46
1	BBB	626	ASN	CB-CA-C	6.18	123.65	116.54
1	BBB	285	ARG	NE-CZ-NH1	-6.18	115.32	121.50
1	BBB	70	THR	N-CA-CB	-6.15	102.12	110.67
1	FFF	500	THR	N-CA-C	-6.15	105.64	113.01
1	AAA	163	THR	CA-CB-OG1	-6.10	100.44	109.60
1	AAA	500	THR	N-CA-C	-6.08	105.83	113.18
1	CCC	500	THR	N-CA-C	-6.04	105.77	113.01
1	BBB	500	THR	N-CA-C	-6.01	105.91	113.18
1	AAA	26	LEU	CA-C-N	6.00	130.29	120.63
1	AAA	26	LEU	C-N-CA	6.00	130.29	120.63
1	CCC	529	PHE	CA-C-N	5.97	128.88	120.28
1	CCC	529	PHE	C-N-CA	5.97	128.88	120.28
1	DDD	409	LYS	CA-C-O	-5.97	115.22	121.55
1	FFF	533	ASN	CA-C-O	-5.95	112.00	120.51
1	BBB	394	TYR	CA-C-O	-5.95	114.50	121.46
1	AAA	523	ASN	CA-CB-CG	-5.94	106.66	112.60
1	BBB	666	ASN	CB-CA-C	5.88	120.59	111.13
1	CCC	533	ASN	CA-CB-CG	5.83	118.43	112.60
1	EEE	500	THR	N-CA-C	-5.80	105.70	112.89
1	EEE	196	VAL	N-CA-CB	-5.76	101.71	112.36
1	BBB	522	GLU	CB-CG-CD	5.75	122.38	112.60
1	FFF	116	GLU	CB-CA-C	5.70	120.03	109.54
1	AAA	409	LYS	CA-C-O	-5.64	115.57	121.55
1	DDD	250	THR	CA-CB-CG2	5.62	120.05	110.50
1	CCC	650	GLY	CA-C-O	-5.61	118.27	122.37
1	DDD	394	TYR	CA-C-O	-5.59	114.92	121.46
1	BBB	681	LYS	CA-C-O	-5.56	111.35	120.80
1	AAA	479	GLU	CB-CG-CD	5.48	121.92	112.60
1	CCC	394	TYR	CA-C-O	-5.47	115.06	121.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	AAA	249	ARG	CA-C-N	5.43	127.81	120.38
1	AAA	249	ARG	C-N-CA	5.43	127.81	120.38
1	AAA	307	GLY	CA-C-O	-5.42	117.52	122.24
1	AAA	529	PHE	CA-C-N	5.36	127.40	120.44
1	AAA	529	PHE	C-N-CA	5.36	127.40	120.44
1	CCC	522	GLU	CA-C-N	5.35	127.71	120.38
1	CCC	522	GLU	C-N-CA	5.35	127.71	120.38
1	EEE	307	GLY	CA-C-O	-5.29	117.64	122.24
1	EEE	394	TYR	CA-C-O	-5.27	115.29	121.46
1	AAA	27	PHE	CA-CB-CG	5.27	119.07	113.80
1	BBB	517	GLU	CB-CA-C	5.25	121.73	110.45
1	BBB	307	GLY	CA-C-O	-5.21	117.71	122.24
1	EEE	529	PHE	CA-C-N	5.20	127.20	120.44
1	EEE	529	PHE	C-N-CA	5.20	127.20	120.44
1	BBB	529	PHE	CA-C-N	5.19	127.19	120.44
1	BBB	529	PHE	C-N-CA	5.19	127.19	120.44
1	EEE	290	GLU	CB-CG-CD	5.18	121.41	112.60
1	BBB	406	THR	N-CA-C	-5.18	106.97	113.28
1	EEE	647	GLY	CA-C-O	-5.17	117.81	122.57
1	FFF	406	THR	CA-C-N	5.10	131.28	121.54
1	FFF	406	THR	C-N-CA	5.10	131.28	121.54
1	CCC	247	THR	CA-CB-OG1	-5.10	101.95	109.60
1	AAA	394	TYR	CA-C-O	-5.09	115.51	121.46
1	BBB	482	GLY	CA-C-O	-5.08	116.94	121.41
1	FFF	409	LYS	CA-C-O	-5.07	116.17	121.55
1	FFF	307	GLY	CA-C-O	-5.05	117.84	122.24
1	FFF	482	GLY	CA-C-O	-5.04	116.98	121.41
1	DDD	411	ASN	CA-C-O	-5.03	113.32	120.51
1	BBB	374	THR	CA-CB-OG1	-5.03	102.06	109.60
1	AAA	534	TYR	CA-C-O	-5.01	115.37	121.28

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	AAA	5275	5172	5151	38	0
1	BBB	5233	5128	5108	22	0
1	CCC	5232	5126	5107	35	0
1	DDD	5267	5168	5148	37	0
1	EEE	5229	5125	5105	25	0
1	FFF	5246	5141	5120	29	0
2	AAA	4	6	6	0	0
2	BBB	4	6	6	0	0
2	CCC	4	6	6	0	0
2	DDD	4	6	6	0	0
2	EEE	4	6	6	0	0
2	FFF	4	6	6	0	0
3	AAA	11	13	13	0	0
3	BBB	11	13	13	0	0
3	CCC	11	13	13	0	0
3	DDD	11	13	13	1	0
3	EEE	11	13	13	0	0
3	FFF	11	13	13	0	0
4	AAA	1	0	0	0	0
4	BBB	1	0	0	0	0
4	CCC	1	0	0	0	0
4	DDD	1	0	0	0	0
4	EEE	1	0	0	0	0
4	FFF	1	0	0	0	0
5	AAA	168	0	0	0	0
5	BBB	212	0	0	1	0
5	CCC	160	0	0	0	0
5	DDD	131	0	0	1	0
5	EEE	130	0	0	0	0
5	FFF	228	0	0	0	0
All	All	32607	30974	30853	176	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.

All (176) 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:AAA:53:THR:H	1:AAA:56:GLN:HE21	1.05	0.98
1:AAA:365:ALA:O	1:AAA:368:THR:HG22	1.68	0.93
1:AAA:620:MET:SD	1:AAA:633:ILE:CD1	2.60	0.90
1:AAA:379:MET:HE1	1:AAA:655:LEU:HD21	1.58	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:AAA:53:THR:N	1:AAA:56:GLN:HE21	1.78	0.81
1:AAA:620:MET:SD	1:AAA:633:ILE:HD11	2.26	0.75
1:BBB:410:LEU:O	1:BBB:411:ASN:C	2.31	0.73
1:FFF:33:ARG:HD2	1:FFF:228:ASP:OD1	1.91	0.71
1:AAA:53:THR:H	1:AAA:56:GLN:NE2	1.86	0.69
1:CCC:410:LEU:O	1:CCC:411:ASN:ND2	2.24	0.68
1:AAA:81:MET:HE3	1:AAA:93:PHE:CD2	2.28	0.68
1:DDD:41:PHE:HB2	1:DDD:70:THR:HG22	1.74	0.68
1:DDD:310:PRO:HB2	1:FFF:520:ILE:HD13	1.76	0.67
1:EEE:81:MET:HE3	1:EEE:93:PHE:CD2	2.29	0.67
1:EEE:60:TRP:HE1	1:EEE:357:ASN:ND2	1.92	0.66
1:CCC:60:TRP:HE1	1:CCC:357:ASN:ND2	1.93	0.65
1:AAA:60:TRP:HE1	1:AAA:357:ASN:ND2	1.95	0.65
1:DDD:520:ILE:HD13	1:EEE:310:PRO:HB2	1.79	0.65
1:FFF:523:ASN:HB3	1:FFF:585:GLU:OE1	1.98	0.64
1:AAA:528:ASP:OD1	1:AAA:535:LYS:HE2	1.98	0.64
1:DDD:60:TRP:HE1	1:DDD:357:ASN:ND2	1.95	0.63
1:CCC:406:THR:O	1:CCC:409:LYS:HD2	1.98	0.62
1:CCC:619:MET:CE	1:CCC:634:ILE:HD12	2.29	0.62
1:CCC:310:PRO:HB2	1:BBB:520:ILE:HD13	1.80	0.62
1:AAA:295:MET:HG2	1:AAA:298:LEU:HD11	1.81	0.62
1:CCC:531:LYS:HE2	1:CCC:531:LYS:HA	1.80	0.62
1:FFF:31:ALA:HB2	1:FFF:226:GLN:HG2	1.82	0.61
1:DDD:523:ASN:HB3	1:DDD:585:GLU:OE1	2.02	0.60
1:EEE:293:TRP:HH2	1:EEE:325:ASN:HD22	1.48	0.60
1:EEE:516:ILE:HG13	1:EEE:517:GLU:N	2.16	0.60
1:AAA:531:LYS:HB2	1:DDD:26:LEU:HA	1.84	0.60
1:EEE:516:ILE:HG13	1:EEE:517:GLU:H	1.67	0.60
1:FFF:310:PRO:HB2	1:EEE:520:ILE:HD13	1.82	0.59
1:DDD:324:ILE:HG12	1:DDD:619:MET:HE1	1.85	0.59
1:DDD:648:GLY:O	1:DDD:649:LYS:HE2	2.03	0.59
1:BBB:371:LYS:HE2	1:BBB:375:GLU:OE2	2.03	0.58
1:CCC:619:MET:HE3	1:CCC:634:ILE:HB	1.85	0.58
1:CCC:531:LYS:HA	1:CCC:531:LYS:CE	2.33	0.57
1:DDD:41:PHE:HB2	1:DDD:70:THR:CG2	2.34	0.57
1:EEE:642:THR:CG2	1:EEE:667:LYS:HG3	2.35	0.57
1:AAA:410:LEU:N	1:AAA:411:ASN:HD22	2.03	0.56
1:AAA:520:ILE:HD13	1:BBB:310:PRO:HB2	1.87	0.56
1:FFF:410:LEU:O	1:FFF:411:ASN:ND2	2.22	0.56
1:DDD:648:GLY:C	1:DDD:649:LYS:HD2	2.31	0.56
1:FFF:166:LEU:HG	1:FFF:167:PRO:HD2	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:CCC:533:ASN:HB3	1:CCC:534:TYR:CD2	2.43	0.54
1:FFF:169:ASN:H	1:FFF:169:ASN:HD22	1.55	0.54
1:AAA:311:LEU:HA	1:CCC:520:ILE:CG2	2.38	0.54
1:AAA:620:MET:SD	1:AAA:633:ILE:HD12	2.47	0.53
1:FFF:31:ALA:CB	1:FFF:226:GLN:HG2	2.38	0.53
1:CCC:619:MET:CE	1:CCC:634:ILE:HB	2.39	0.53
1:DDD:408:GLY:HA2	1:DDD:417:ILE:CD1	2.39	0.53
1:BBB:168:PHE:CE2	1:BBB:201:LYS:HE3	2.45	0.52
1:DDD:648:GLY:O	1:DDD:649:LYS:CE	2.58	0.52
1:CCC:619:MET:HE3	1:CCC:634:ILE:HD12	1.92	0.52
1:CCC:487:ASP:HA	1:CCC:575:ILE:O	2.10	0.51
1:DDD:408:GLY:HA2	1:DDD:417:ILE:HD11	1.92	0.51
1:AAA:343:THR:OG1	1:CCC:498:HIS:HD2	1.94	0.51
1:AAA:620:MET:HG3	1:AAA:633:ILE:HD13	1.93	0.50
1:CCC:274:THR:HB	1:CCC:619:MET:CE	2.42	0.50
1:DDD:378:LYS:HE3	1:DDD:626:ASN:ND2	2.27	0.50
1:EEE:487:ASP:HA	1:EEE:575:ILE:O	2.12	0.50
1:DDD:410:LEU:O	1:DDD:411:ASN:ND2	2.29	0.50
1:CCC:531:LYS:CE	1:CCC:531:LYS:CA	2.90	0.50
1:BBB:168:PHE:CD2	1:BBB:201:LYS:HE3	2.47	0.50
1:AAA:175:GLU:OE1	1:AAA:175:GLU:HA	2.12	0.50
1:AAA:487:ASP:HA	1:AAA:575:ILE:O	2.12	0.50
1:BBB:487:ASP:HA	1:BBB:575:ILE:O	2.12	0.50
1:AAA:620:MET:CG	1:AAA:633:ILE:HD13	2.42	0.49
1:CCC:408:GLY:HA2	1:CCC:417:ILE:HD11	1.95	0.49
1:FFF:467:ASP:O	1:FFF:470:VAL:HG12	2.12	0.49
1:AAA:411:ASN:ND2	1:AAA:411:ASN:N	2.61	0.49
1:CCC:619:MET:HE1	1:CCC:634:ILE:HD12	1.93	0.49
1:EEE:642:THR:HG23	1:EEE:667:LYS:HG3	1.95	0.49
1:DDD:487:ASP:HA	1:DDD:575:ILE:O	2.13	0.48
1:FFF:487:ASP:HA	1:FFF:575:ILE:O	2.13	0.48
1:DDD:172:PHE:O	1:DDD:176:ARG:HG2	2.14	0.48
1:FFF:33:ARG:CG	1:FFF:33:ARG:HH21	2.26	0.48
1:FFF:196:VAL:HB	1:FFF:496:GLN:HB3	1.96	0.47
1:AAA:247:THR:O	1:AAA:250:THR:HB	2.14	0.47
1:AAA:196:VAL:HB	1:AAA:496:GLN:HB3	1.95	0.47
1:DDD:221:ARG:O	1:DDD:225:LYS:HE2	2.14	0.47
1:DDD:196:VAL:HB	1:DDD:496:GLN:HB3	1.96	0.47
1:BBB:467:ASP:O	1:BBB:470:VAL:HG12	2.14	0.47
1:BBB:196:VAL:HB	1:BBB:496:GLN:HB3	1.95	0.47
1:BBB:202:GLU:HB3	1:BBB:400:TRP:CE2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:BBB:595:LEU:O	1:BBB:598:SER:HB2	2.15	0.47
1:EEE:54:GLN:NE2	1:EEE:99:LEU:HD11	2.30	0.47
1:CCC:196:VAL:HB	1:CCC:496:GLN:HB3	1.96	0.47
1:CCC:274:THR:HB	1:CCC:619:MET:HE1	1.96	0.46
1:DDD:41:PHE:CB	1:DDD:70:THR:CG2	2.93	0.46
1:DDD:54:GLN:NE2	1:DDD:95:ARG:HG3	2.31	0.46
1:EEE:129:ARG:NH2	1:EEE:175:GLU:OE2	2.45	0.46
1:FFF:162:GLY:HA2	1:FFF:209:HIS:NE2	2.31	0.46
1:CCC:304:LEU:HB2	1:CCC:349:GLU:CD	2.41	0.46
1:AAA:452:ASP:OD1	1:AAA:454:THR:HG22	2.15	0.46
1:DDD:202:GLU:HB3	1:DDD:400:TRP:CE2	2.51	0.45
1:FFF:304:LEU:HB2	1:FFF:349:GLU:CD	2.41	0.45
1:AAA:202:GLU:HB3	1:AAA:400:TRP:CE2	2.52	0.45
1:CCC:290:GLU:OE2	1:CCC:290:GLU:HA	2.16	0.45
1:DDD:378:LYS:HE3	1:DDD:626:ASN:HD22	1.82	0.45
1:DDD:410:LEU:N	1:DDD:410:LEU:HD13	2.30	0.45
1:CCC:221:ARG:O	1:CCC:225:LYS:HE2	2.17	0.45
1:EEE:95:ARG:O	1:EEE:99:LEU:HD13	2.16	0.45
1:DDD:54:GLN:HG2	1:DDD:95:ARG:HD2	1.97	0.45
1:AAA:455:ASP:HA	1:AAA:601:PRO:HG2	1.99	0.45
1:BBB:245:PHE:N	1:BBB:246:PRO:CD	2.80	0.45
1:AAA:410:LEU:O	1:AAA:411:ASN:C	2.60	0.45
1:FFF:202:GLU:HB3	1:FFF:400:TRP:CE2	2.52	0.45
1:CCC:241:GLY:HA3	1:CCC:399:MET:HE2	1.98	0.45
1:FFF:166:LEU:HD22	1:FFF:168:PHE:CE2	2.52	0.44
1:AAA:44:ALA:O	1:AAA:72:CYS:HA	2.17	0.44
1:AAA:81:MET:HE1	1:AAA:146:PHE:CE2	2.52	0.44
1:CCC:166:LEU:HD13	1:CCC:205:ILE:HD13	1.98	0.44
1:BBB:70:THR:HG22	1:BBB:71:THR:OG1	2.17	0.44
1:FFF:461:SER:HA	1:FFF:487:ASP:OD1	2.18	0.44
1:EEE:202:GLU:HB3	1:EEE:400:TRP:CE2	2.53	0.44
1:AAA:221:ARG:O	1:AAA:225:LYS:HE2	2.18	0.43
1:DDD:245:PHE:N	1:DDD:246:PRO:CD	2.81	0.43
1:BBB:44:ALA:O	1:BBB:72:CYS:HA	2.18	0.43
1:FFF:620:MET:HA	1:FFF:632:LEU:O	2.18	0.43
1:DDD:455:ASP:HA	1:DDD:601:PRO:HG2	2.00	0.43
1:FFF:549:LYS:NZ	1:FFF:549:LYS:HB3	2.34	0.43
1:EEE:245:PHE:N	1:EEE:246:PRO:CD	2.81	0.43
1:AAA:461:SER:HA	1:AAA:487:ASP:OD1	2.19	0.43
1:EEE:44:ALA:O	1:EEE:72:CYS:HA	2.19	0.43
1:CCC:461:SER:HA	1:CCC:487:ASP:OD1	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:FFF:527:LEU:HD11	1:FFF:577:SER:HB2	2.01	0.43
1:FFF:608:ASN:O	1:FFF:610:HIS:HD2	2.02	0.43
1:EEE:371:LYS:HE3	1:EEE:375:GLU:OE2	2.19	0.43
1:CCC:202:GLU:HB3	1:CCC:400:TRP:CE2	2.53	0.43
1:CCC:619:MET:HB3	1:CCC:619:MET:HE2	1.70	0.43
1:EEE:60:TRP:HE1	1:EEE:357:ASN:HD22	1.66	0.42
1:EEE:461:SER:HA	1:EEE:487:ASP:OD1	2.18	0.42
1:DDD:620:MET:HA	1:DDD:632:LEU:O	2.19	0.42
1:CCC:245:PHE:N	1:CCC:246:PRO:CD	2.82	0.42
1:FFF:245:PHE:N	1:FFF:246:PRO:CD	2.82	0.42
1:CCC:608:ASN:O	1:CCC:610:HIS:HD2	2.02	0.42
1:CCC:620:MET:HA	1:CCC:632:LEU:O	2.19	0.42
1:DDD:643:VAL:HG12	1:DDD:668:LEU:HB3	2.02	0.42
1:CCC:455:ASP:HA	1:CCC:601:PRO:HG2	2.02	0.42
1:DDD:399:MET:HE3	5:DDD:858:HOH:O	2.19	0.42
1:EEE:620:MET:HA	1:EEE:632:LEU:O	2.19	0.42
1:DDD:83:THR:HA	1:BBB:660:ASN:ND2	2.33	0.42
1:EEE:536:LEU:HD11	1:EEE:595:LEU:HD22	2.02	0.42
1:BBB:162:GLY:HA2	1:BBB:209:HIS:NE2	2.35	0.42
1:AAA:608:ASN:O	1:AAA:610:HIS:HD2	2.03	0.42
1:FFF:421:MET:HE1	1:FFF:440:PHE:CE2	2.55	0.42
1:FFF:536:LEU:HD11	1:FFF:595:LEU:HD22	2.01	0.42
1:AAA:245:PHE:N	1:AAA:246:PRO:CD	2.83	0.42
1:BBB:461:SER:HA	1:BBB:487:ASP:OD1	2.19	0.42
1:BBB:608:ASN:O	1:BBB:610:HIS:HD2	2.02	0.42
1:FFF:44:ALA:O	1:FFF:72:CYS:HA	2.20	0.42
1:EEE:608:ASN:O	1:EEE:610:HIS:HD2	2.03	0.42
1:EEE:643:VAL:HG22	1:EEE:668:LEU:HB3	2.02	0.41
1:DDD:608:ASN:O	1:DDD:610:HIS:HD2	2.02	0.41
1:BBB:620:MET:HA	1:BBB:632:LEU:O	2.20	0.41
1:FFF:169:ASN:H	1:FFF:169:ASN:ND2	2.19	0.41
1:EEE:162:GLY:HA2	1:EEE:209:HIS:NE2	2.34	0.41
1:AAA:411:ASN:HD22	1:AAA:411:ASN:N	2.19	0.41
1:CCC:33:ARG:HD3	1:CCC:226:GLN:O	2.21	0.41
1:AAA:620:MET:CG	1:AAA:633:ILE:CD1	2.99	0.41
1:DDD:311:LEU:HA	1:FFF:520:ILE:CG2	2.51	0.41
1:CCC:44:ALA:O	1:CCC:72:CYS:HA	2.20	0.41
1:AAA:452:ASP:CG	1:AAA:454:THR:HG22	2.45	0.41
1:FFF:423:SER:HB3	1:FFF:424:PRO:HD3	2.01	0.41
1:AAA:620:MET:HA	1:AAA:632:LEU:O	2.20	0.41
1:DDD:452:ASP:OD1	1:DDD:454:THR:OG1	2.32	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:DDD:461:SER:HA	1:DDD:487:ASP:OD1	2.20	0.41
1:DDD:44:ALA:O	1:DDD:72:CYS:HA	2.20	0.41
1:BBB:47:PHE:CZ	1:BBB:341:ARG:HG2	2.56	0.41
1:BBB:407:ARG:NH1	5:BBB:817:HOH:O	2.54	0.40
1:DDD:336:TRP:CZ2	3:DDD:702:MNM:HC1	2.56	0.40
1:CCC:41:PHE:O	1:CCC:332:GLY:HA2	2.22	0.40
1:BBB:378:LYS:HE2	1:BBB:626:ASN:ND2	2.37	0.40
1:EEE:452:ASP:OD1	1:EEE:454:THR:OG1	2.31	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	AAA	649/674 (96%)	630 (97%)	19 (3%)	0	100	100
1	BBB	646/674 (96%)	630 (98%)	16 (2%)	0	100	100
1	CCC	648/674 (96%)	631 (97%)	16 (2%)	1 (0%)	44	38
1	DDD	651/674 (97%)	631 (97%)	18 (3%)	2 (0%)	37	31
1	EEE	646/674 (96%)	625 (97%)	21 (3%)	0	100	100
1	FFF	648/674 (96%)	625 (96%)	22 (3%)	1 (0%)	44	38
All	All	3888/4044 (96%)	3772 (97%)	112 (3%)	4 (0%)	48	45

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	DDD	411	ASN
1	CCC	411	ASN
1	FFF	407	ARG
1	DDD	530	GLU

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	AAA	567/582 (97%)	555 (98%)	12 (2%)	48	45
1	BBB	562/582 (97%)	553 (98%)	9 (2%)	58	57
1	CCC	562/582 (97%)	541 (96%)	21 (4%)	29	23
1	DDD	565/582 (97%)	550 (97%)	15 (3%)	40	35
1	EEE	561/582 (96%)	549 (98%)	12 (2%)	48	45
1	FFF	564/582 (97%)	545 (97%)	19 (3%)	32	26
All	All	3381/3492 (97%)	3293 (97%)	88 (3%)	41	37

All (88) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	AAA	26	LEU
1	AAA	27	PHE
1	AAA	28	GLN
1	AAA	87	THR
1	AAA	182	LYS
1	AAA	192	LYS
1	AAA	296	THR
1	AAA	410	LEU
1	AAA	411	ASN
1	AAA	487	ASP
1	AAA	523	ASN
1	AAA	681	LYS
1	DDD	25	VAL
1	DDD	26	LEU
1	DDD	33	ARG
1	DDD	116	GLU
1	DDD	133	LYS
1	DDD	242	LEU
1	DDD	311	LEU
1	DDD	410	LEU
1	DDD	420	VAL
1	DDD	487	ASP

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Mol	Chain	Res	Type
1	DDD	526	SER
1	DDD	534	TYR
1	DDD	536	LEU
1	DDD	643	VAL
1	DDD	649	LYS
1	CCC	82	LYS
1	CCC	116	GLU
1	CCC	176	ARG
1	CCC	242	LEU
1	CCC	290	GLU
1	CCC	296	THR
1	CCC	304	LEU
1	CCC	378	LYS
1	CCC	409	LYS
1	CCC	427	TYR
1	CCC	487	ASP
1	CCC	516	ILE
1	CCC	520	ILE
1	CCC	522	GLU
1	CCC	526	SER
1	CCC	528	ASP
1	CCC	530	GLU
1	CCC	603	LYS
1	CCC	619	MET
1	CCC	639	SER
1	CCC	649	LYS
1	BBB	32	GLU
1	BBB	56	GLN
1	BBB	174	LYS
1	BBB	182	LYS
1	BBB	409	LYS
1	BBB	487	ASP
1	BBB	534	TYR
1	BBB	536	LEU
1	BBB	569	LYS
1	FFF	32	GLU
1	FFF	33	ARG
1	FFF	56	GLN
1	FFF	150	LYS
1	FFF	166	LEU
1	FFF	169	ASN
1	FFF	187	SER

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Mol	Chain	Res	Type
1	FFF	197	LEU
1	FFF	225	LYS
1	FFF	291	LEU
1	FFF	311	LEU
1	FFF	407	ARG
1	FFF	410	LEU
1	FFF	411	ASN
1	FFF	487	ASP
1	FFF	522	GLU
1	FFF	526	SER
1	FFF	530	GLU
1	FFF	651	LYS
1	EEE	82	LYS
1	EEE	182	LYS
1	EEE	196	VAL
1	EEE	291	LEU
1	EEE	311	LEU
1	EEE	427	TYR
1	EEE	450	LEU
1	EEE	469	LYS
1	EEE	487	ASP
1	EEE	526	SER
1	EEE	533	ASN
1	EEE	556	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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

Of 18 ligands modelled in this entry, 6 are monoatomic - leaving 12 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
3	MNM	EEE	702	-	9,11,11	0.50	0	10,15,15	1.84	1 (10%)
3	MNM	BBB	702	-	9,11,11	0.74	0	10,15,15	1.59	1 (10%)
2	EDO	BBB	701	-	3,3,3	1.41	0	2,2,2	0.92	0
2	EDO	DDD	701	-	3,3,3	0.62	0	2,2,2	0.40	0
3	MNM	DDD	702	-	9,11,11	0.61	0	10,15,15	1.50	1 (10%)
2	EDO	AAA	701	-	3,3,3	0.62	0	2,2,2	0.33	0
3	MNM	FFF	702	-	9,11,11	0.50	0	10,15,15	1.61	1 (10%)
3	MNM	AAA	702	-	9,11,11	0.70	0	10,15,15	1.19	1 (10%)
2	EDO	CCC	701	-	3,3,3	0.44	0	2,2,2	0.47	0
2	EDO	FFF	701	-	3,3,3	0.62	0	2,2,2	0.30	0
2	EDO	EEE	701	-	3,3,3	0.44	0	2,2,2	0.46	0
3	MNM	CCC	702	-	9,11,11	0.85	0	10,15,15	1.28	2 (20%)

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	MNM	EEE	702	-	-	0/2/19/19	0/1/1/1
3	MNM	BBB	702	-	-	0/2/19/19	0/1/1/1
2	EDO	BBB	701	-	-	1/1/1/1	-
2	EDO	DDD	701	-	-	0/1/1/1	-
3	MNM	DDD	702	-	-	0/2/19/19	0/1/1/1
2	EDO	AAA	701	-	-	1/1/1/1	-
3	MNM	FFF	702	-	-	0/2/19/19	0/1/1/1
3	MNM	AAA	702	-	-	0/2/19/19	0/1/1/1
2	EDO	CCC	701	-	-	0/1/1/1	-
2	EDO	FFF	701	-	-	1/1/1/1	-
2	EDO	EEE	701	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MNM	CCC	702	-	-	0/2/19/19	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	EEE	702	MNM	C10-N6-C2	5.07	118.75	108.98
3	FFF	702	MNM	C10-N6-C2	4.28	117.23	108.98
3	DDD	702	MNM	C10-N6-C2	3.81	116.33	108.98
3	BBB	702	MNM	C10-N6-C2	3.64	116.00	108.98
3	CCC	702	MNM	O11-C9-C8	2.33	116.71	111.36
3	AAA	702	MNM	C10-N6-C2	2.27	113.35	108.98
3	CCC	702	MNM	C10-N6-C2	2.22	113.25	108.98

There are no chirality outliers.

All (4) torsion outliers are listed below:

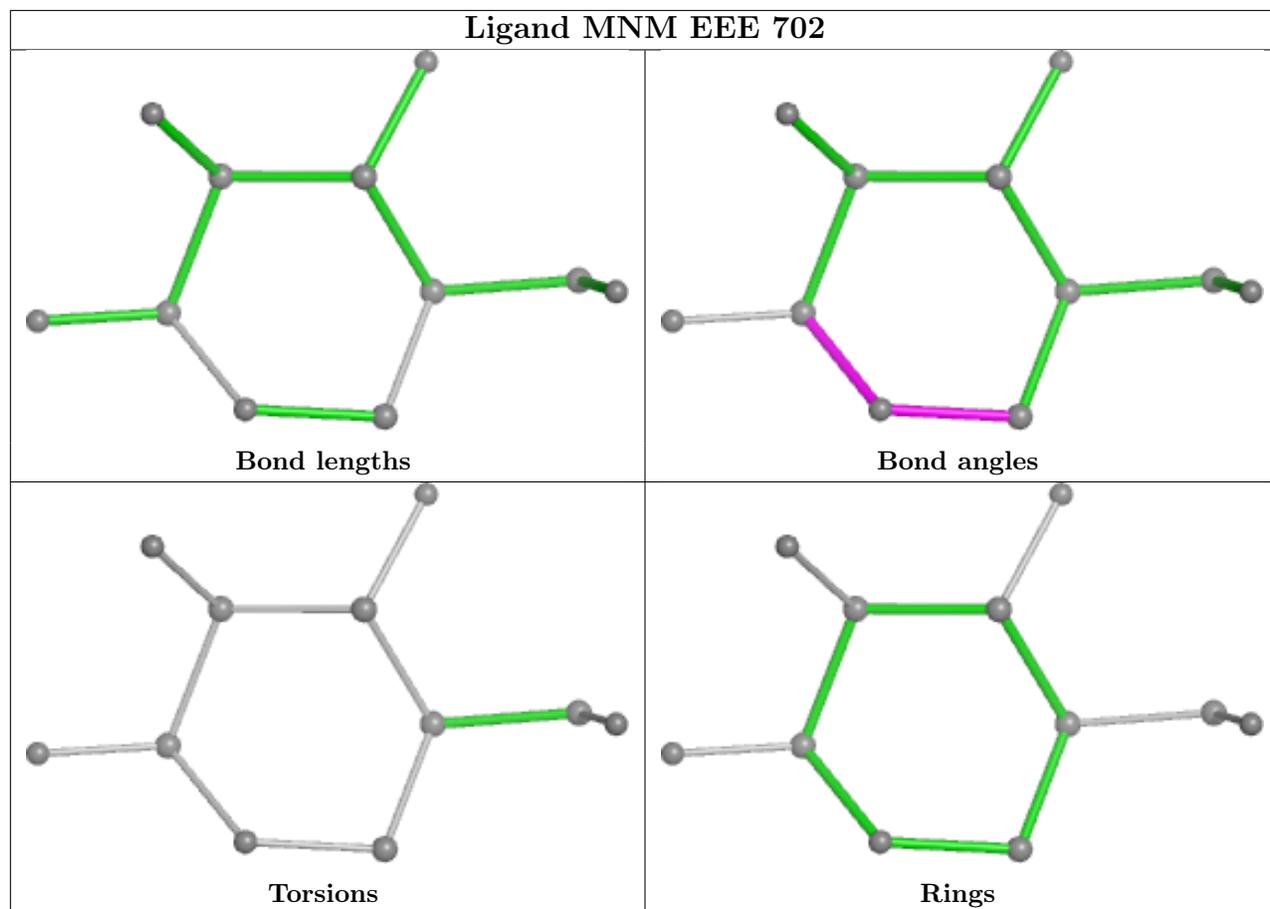
Mol	Chain	Res	Type	Atoms
2	BBB	701	EDO	O1-C1-C2-O2
2	AAA	701	EDO	O1-C1-C2-O2
2	FFF	701	EDO	O1-C1-C2-O2
2	EEE	701	EDO	O1-C1-C2-O2

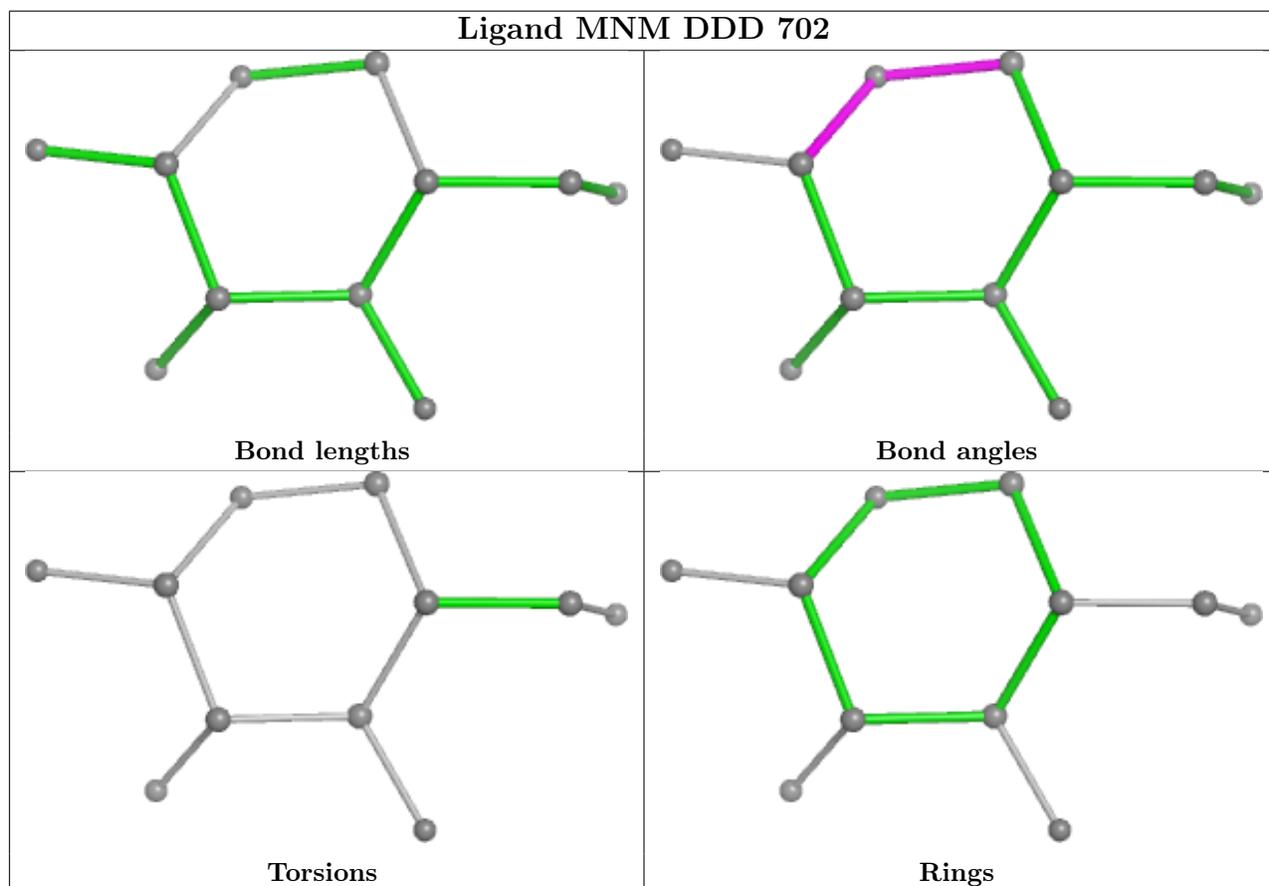
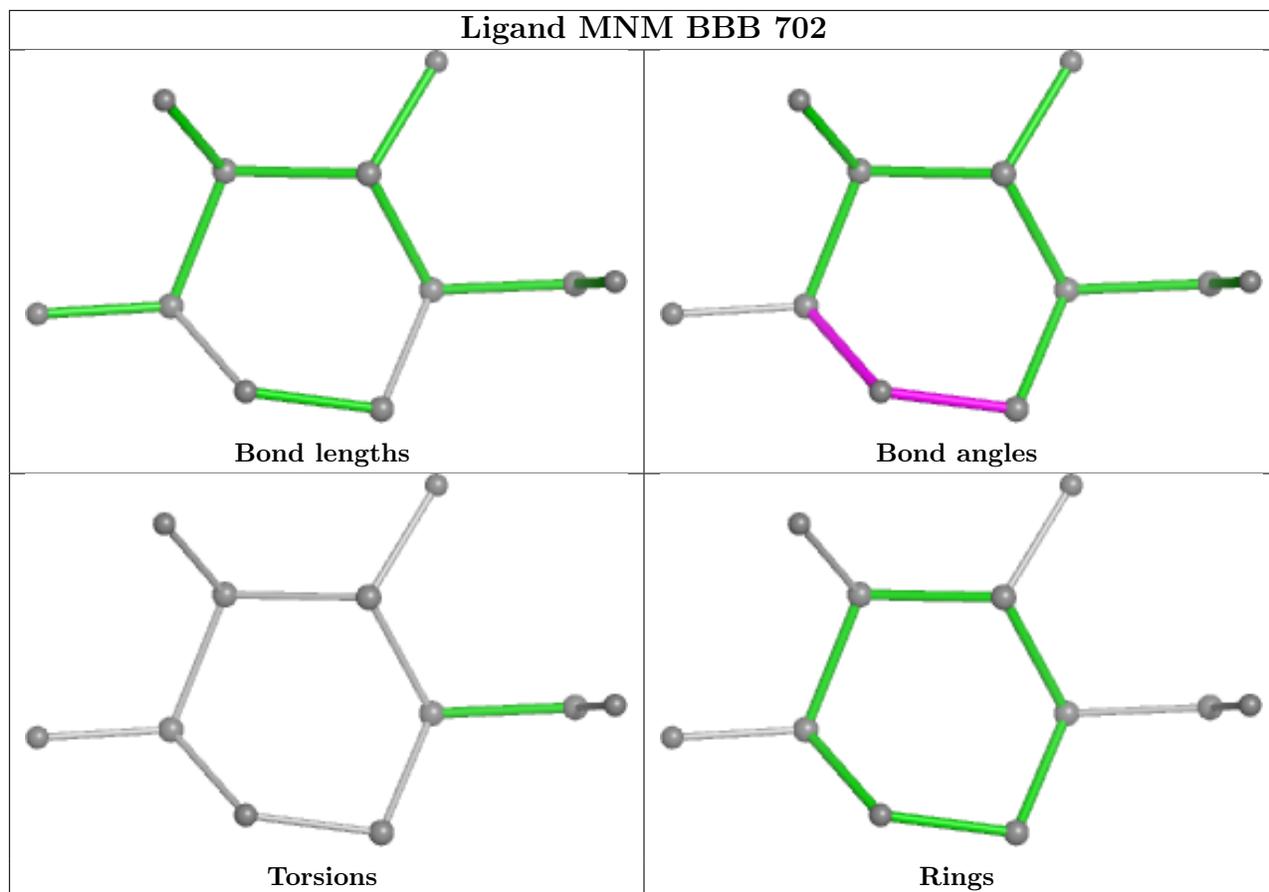
There are no ring outliers.

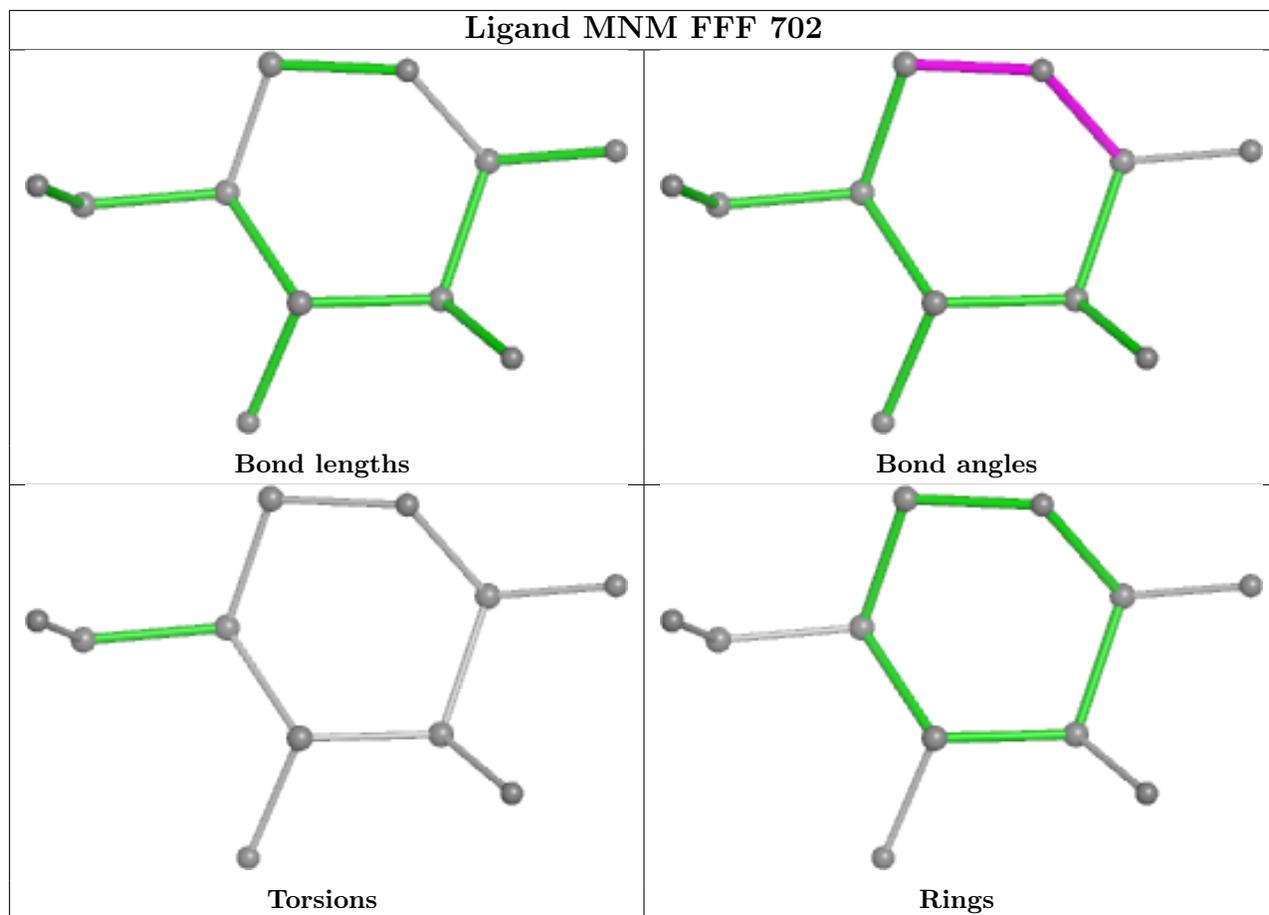
1 monomer is involved in 1 short contact:

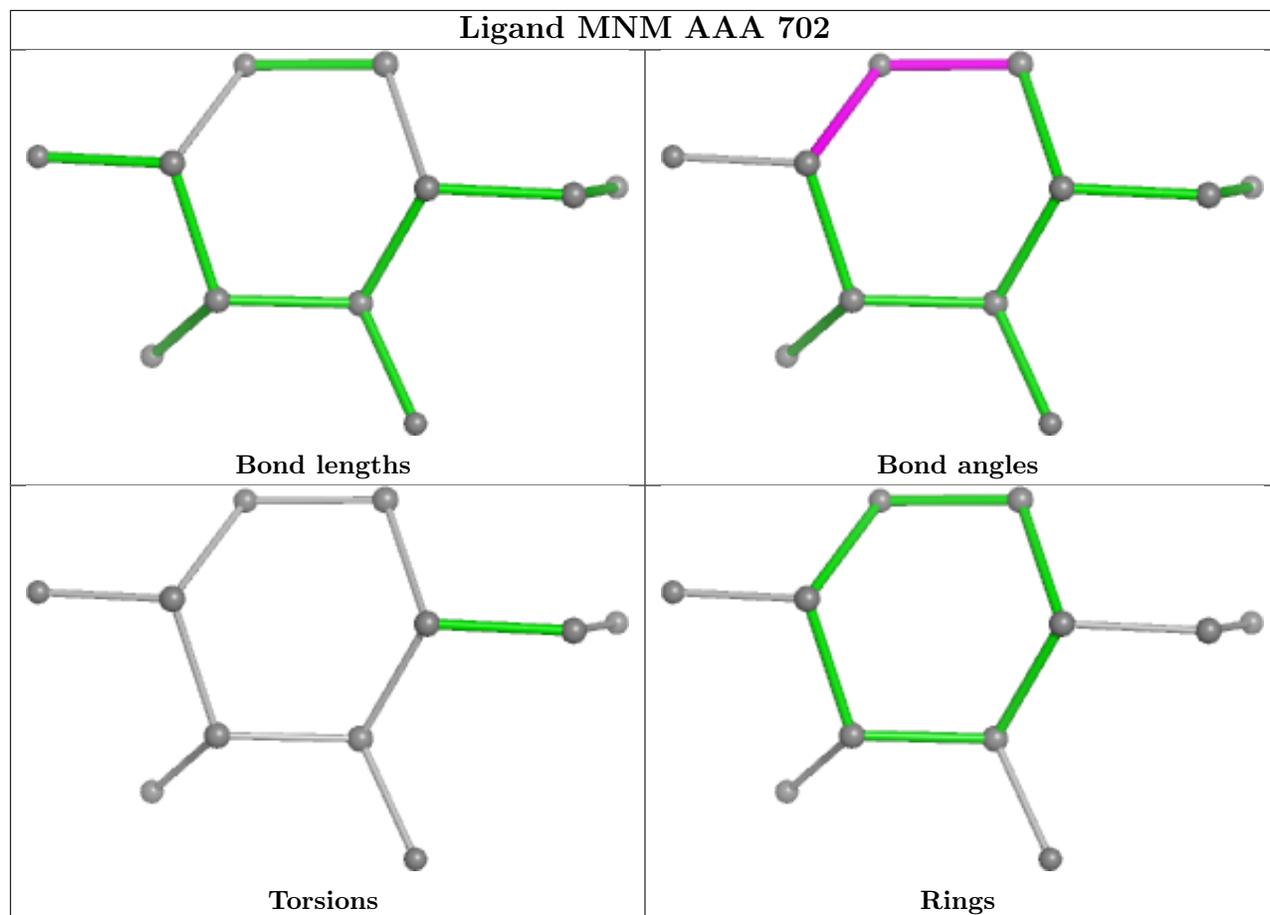
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	DDD	702	MNM	1	0

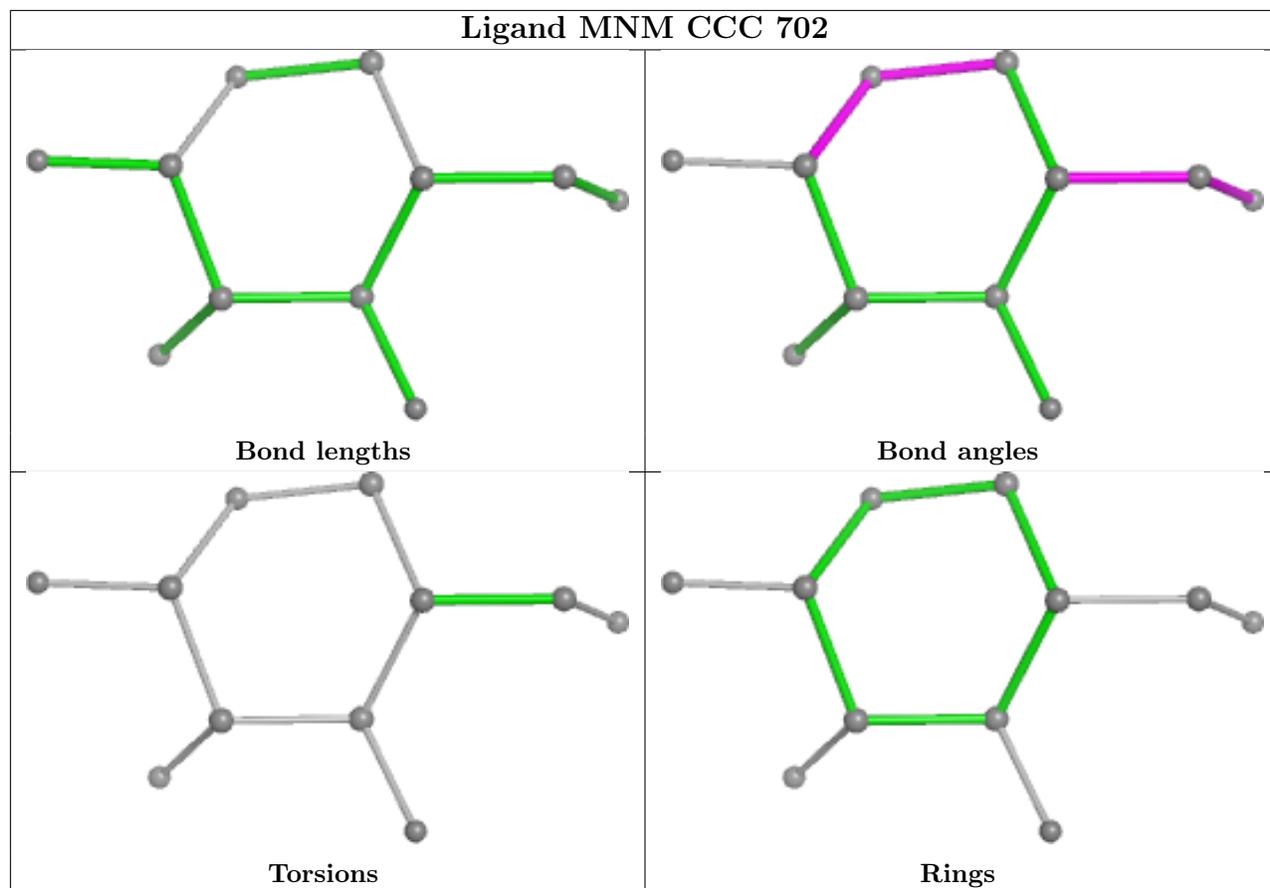
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.











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	AAA	655/674 (97%)	0.25	19 (2%) 54 55	27, 47, 78, 115	0
1	BBB	650/674 (96%)	-0.18	3 (0%) 87 89	20, 37, 63, 90	0
1	CCC	650/674 (96%)	0.05	10 (1%) 71 74	28, 46, 71, 98	0
1	DDD	655/674 (97%)	0.29	25 (3%) 44 46	29, 50, 80, 103	0
1	EEE	650/674 (96%)	0.17	8 (1%) 76 78	27, 49, 77, 106	0
1	FFF	651/674 (96%)	-0.05	9 (1%) 73 75	13, 41, 67, 109	1 (0%)
All	All	3911/4044 (96%)	0.09	74 (1%) 66 68	13, 45, 73, 115	1 (0%)

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	AAA	25	VAL	7.9
1	DDD	25	VAL	7.1
1	AAA	27	PHE	5.8
1	AAA	26	LEU	5.0
1	DDD	412	GLY	4.1
1	FFF	410	LEU	3.7
1	EEE	410	LEU	3.7
1	EEE	385	THR	3.7
1	DDD	27	PHE	3.6
1	AAA	681	LYS	3.5
1	FFF	30	PRO	3.5
1	AAA	84	PRO	3.5
1	CCC	166	LEU	3.5
1	DDD	410	LEU	3.1
1	DDD	529	PHE	3.1
1	DDD	681	LYS	3.1
1	DDD	575	ILE	3.1
1	EEE	665	ALA	3.1
1	FFF	534	TYR	2.9

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Mol	Chain	Res	Type	RSRZ
1	EEE	518	TYR	2.9
1	AAA	29	GLY	2.8
1	AAA	28	GLN	2.8
1	DDD	531	LYS	2.7
1	AAA	529	PHE	2.7
1	DDD	664	THR	2.7
1	BBB	534	TYR	2.7
1	CCC	410	LEU	2.7
1	DDD	662	HIS	2.7
1	DDD	561	ILE	2.6
1	FFF	411	ASN	2.6
1	FFF	166	LEU	2.6
1	DDD	430	ALA	2.5
1	DDD	26	LEU	2.5
1	CCC	412	GLY	2.5
1	FFF	529	PHE	2.5
1	AAA	51	GLY	2.5
1	DDD	643	VAL	2.5
1	AAA	653	PHE	2.4
1	DDD	667	LYS	2.4
1	FFF	31	ALA	2.4
1	DDD	552	PRO	2.4
1	EEE	534	TYR	2.4
1	DDD	534	TYR	2.4
1	DDD	653	PHE	2.4
1	AAA	92	LEU	2.3
1	BBB	410	LEU	2.3
1	AAA	301	GLY	2.3
1	CCC	411	ASN	2.3
1	EEE	543	GLY	2.3
1	DDD	30	PRO	2.2
1	EEE	407	ARG	2.2
1	AAA	87	THR	2.2
1	DDD	665	ALA	2.2
1	BBB	666	ASN	2.2
1	AAA	263	TRP	2.2
1	FFF	84	PRO	2.2
1	CCC	407	ARG	2.2
1	AAA	32	GLU	2.2
1	DDD	645	ILE	2.2
1	DDD	627	GLY	2.2
1	CCC	86	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	DDD	390	ILE	2.1
1	CCC	561	ILE	2.1
1	FFF	657	ALA	2.1
1	CCC	226	GLN	2.1
1	CCC	681	LYS	2.1
1	EEE	651	LYS	2.1
1	AAA	411	ASN	2.1
1	CCC	518	TYR	2.1
1	DDD	553	ILE	2.1
1	DDD	622	SER	2.0
1	AAA	298	LEU	2.0
1	AAA	30	PRO	2.0
1	AAA	455	ASP	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

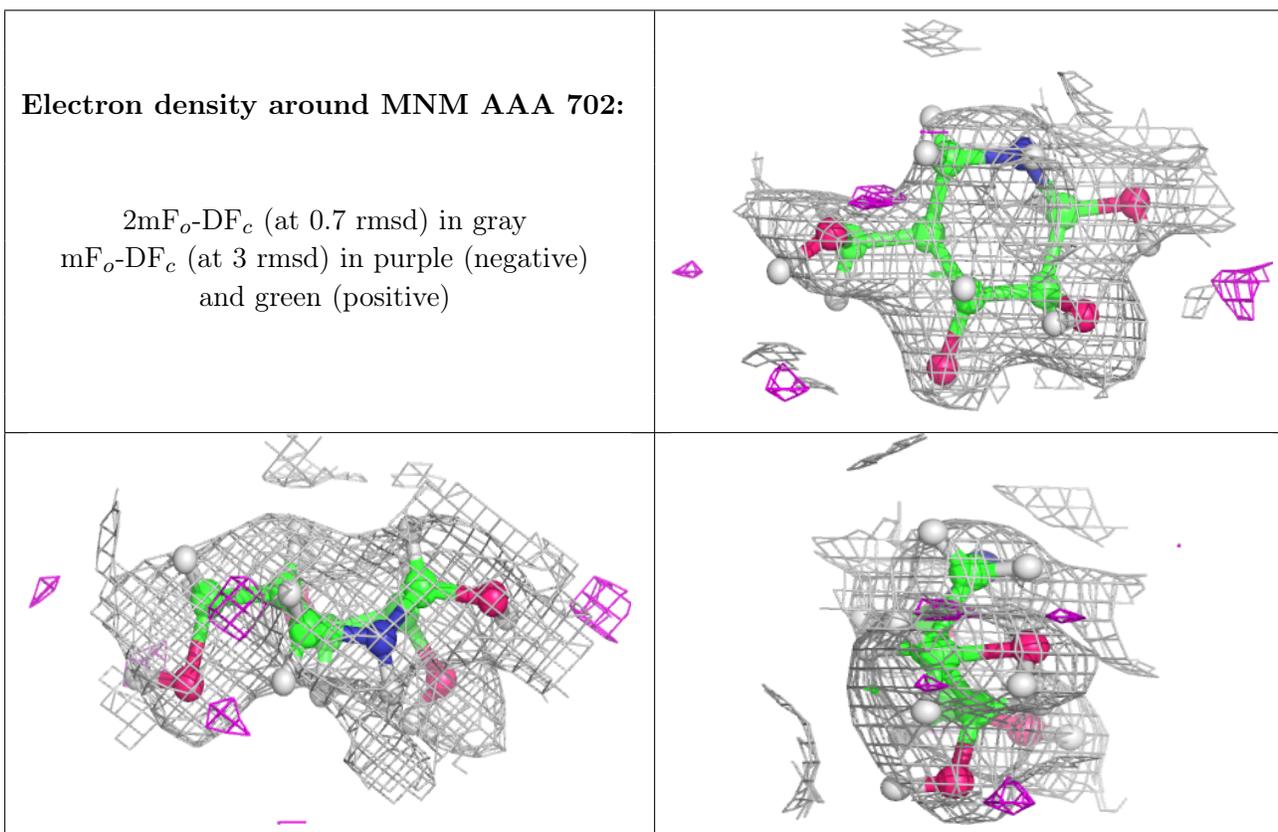
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MNM	AAA	702	11/11	0.93	0.09	37,40,40,43	3
2	EDO	CCC	701	4/4	0.95	0.08	36,37,38,39	1
2	EDO	AAA	701	4/4	0.96	0.11	37,38,38,38	1
3	MNM	DDD	702	11/11	0.96	0.05	33,34,34,34	3
3	MNM	CCC	702	11/11	0.96	0.05	32,33,34,35	3
2	EDO	EEE	701	4/4	0.97	0.07	35,36,36,37	1
2	EDO	DDD	701	4/4	0.97	0.06	29,29,30,30	1
3	MNM	FFF	702	11/11	0.97	0.05	24,24,25,25	3
3	MNM	EEE	702	11/11	0.97	0.06	34,35,36,39	3
4	CL	AAA	703	1/1	0.97	0.18	37,37,37,37	0

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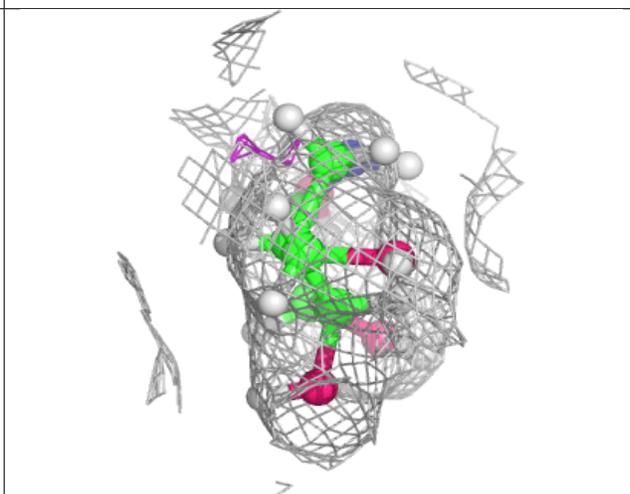
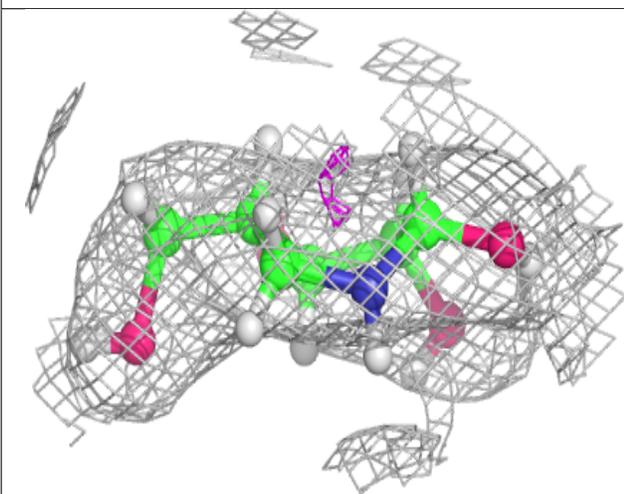
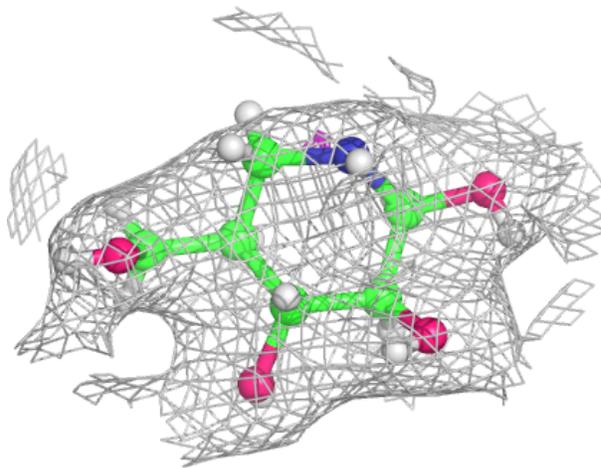
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	EDO	BBB	701	4/4	0.98	0.04	29,29,29,30	1
2	EDO	FFF	701	4/4	0.98	0.09	22,22,22,23	1
3	MNM	BBB	702	11/11	0.98	0.04	27,28,28,28	3
4	CL	CCC	703	1/1	0.98	0.05	32,32,32,32	0
4	CL	EEE	703	1/1	0.98	0.06	44,44,44,44	0
4	CL	FFF	703	1/1	0.99	0.03	26,26,26,26	0
4	CL	DDD	703	1/1	0.99	0.06	35,35,35,35	0
4	CL	BBB	703	1/1	1.00	0.04	31,31,31,31	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.



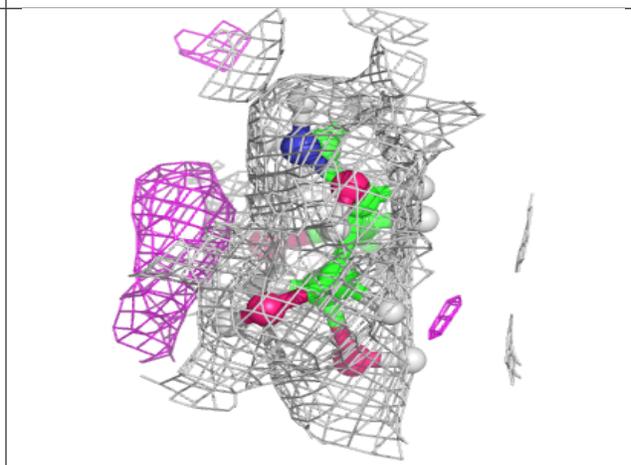
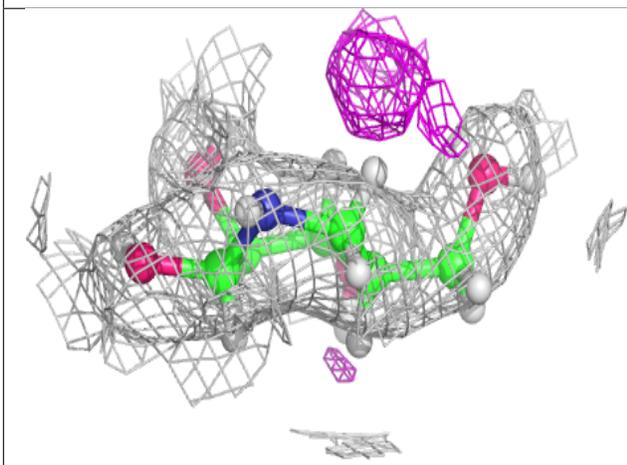
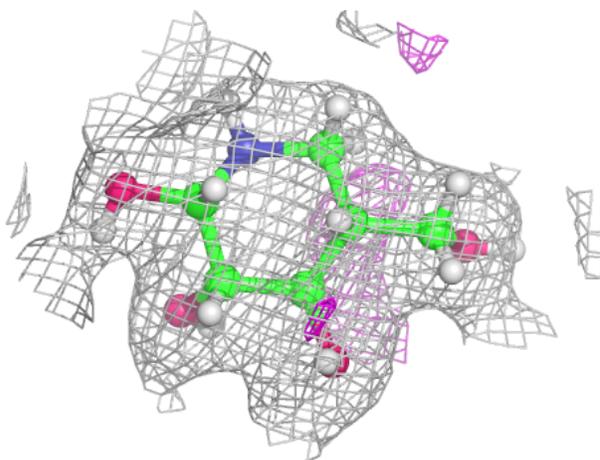
Electron density around MNM DDD 702:

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



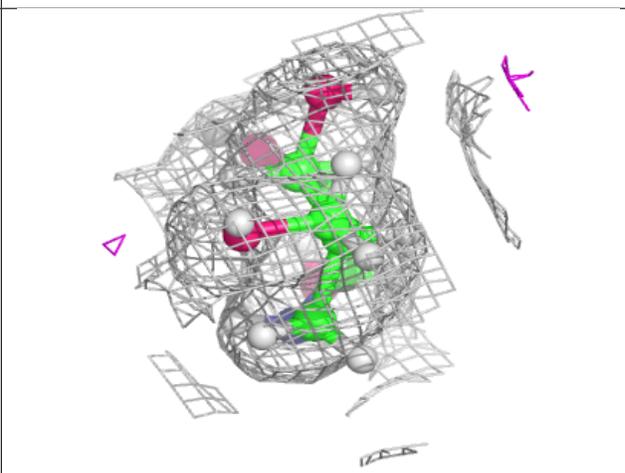
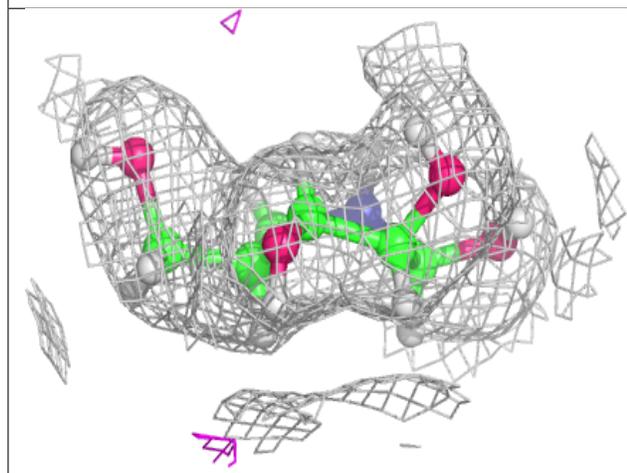
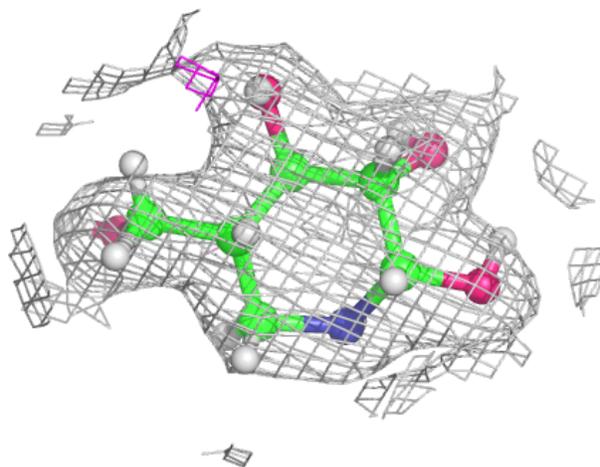
Electron density around MNM CCC 702:

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



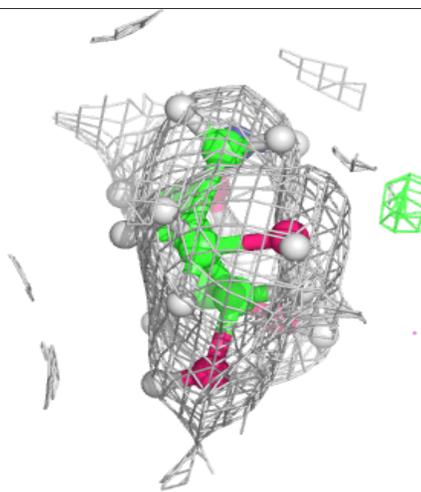
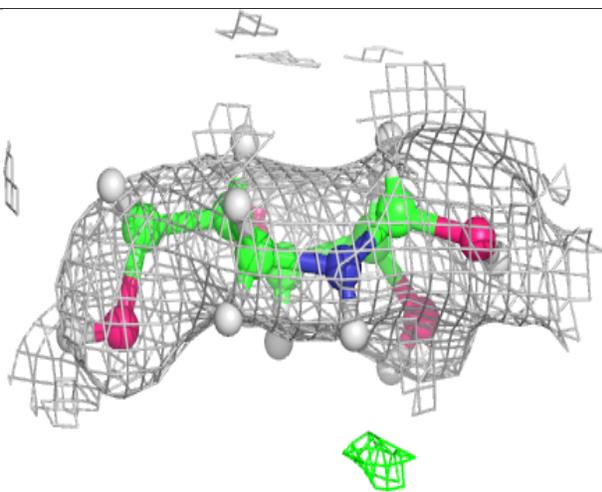
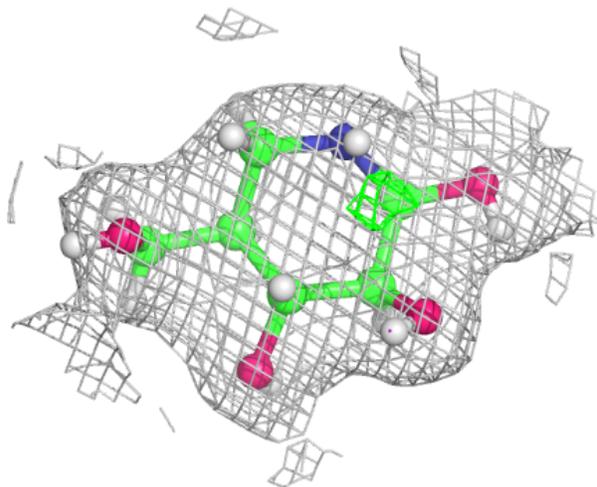
Electron density around MNM FFF 702:

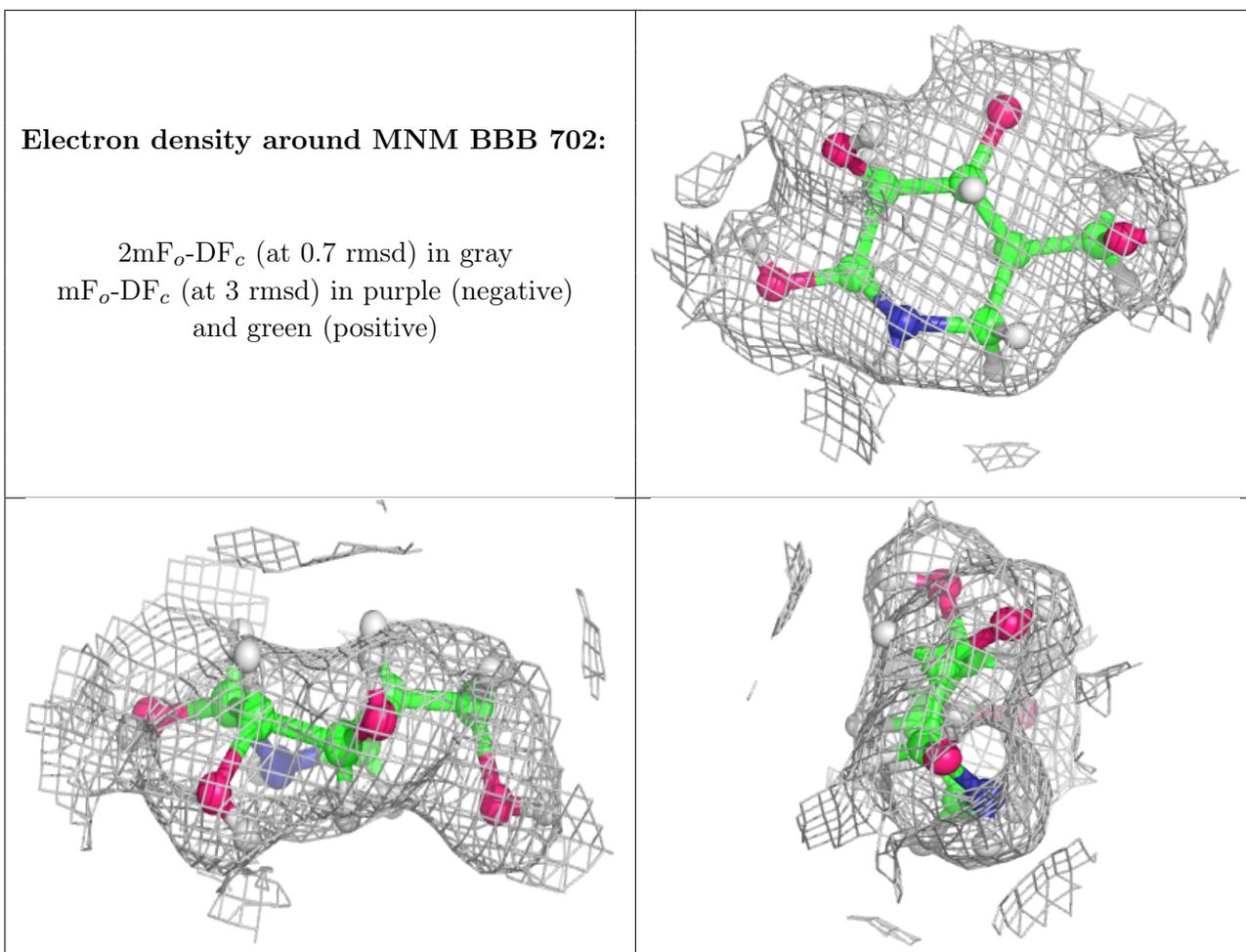
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around MNM EEE 702:

$2mF_o-DF_c$ (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.