



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 09:41 PM UTC

PDB ID : 7YTQ / pdb_00007ytq
Title : Human langerin carbohydrate recognition domain in complex with an alpha-mannoside ligand
Authors : Wangkanont, K.
Deposited on : 2022-08-16
Resolution : 1.60 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 Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

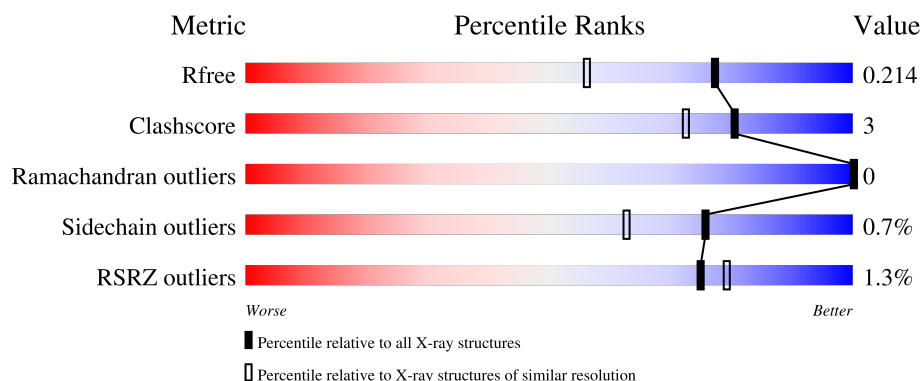
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	156	3% 78% 9% 13%
1	B	156	% 81% • 16%
1	C	156	% 75% 7% 18%
1	D	156	80% • 17%
2	E	2	50% 100%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 5160 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 CD207 molecule.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	136	Total	C	N	O	S	0	2	0
			1118	724	183	206	5			
1	B	131	Total	C	N	O	S	0	1	0
			1072	697	175	195	5			
1	C	128	Total	C	N	O	S	0	3	0
			1066	691	175	195	5			
1	D	129	Total	C	N	O	S	0	5	0
			1092	708	182	197	5			

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	173	ALA	-	expression tag	UNP G3QPX8
A	174	SER	-	expression tag	UNP G3QPX8
A	175	TRP	-	expression tag	UNP G3QPX8
A	176	SER	-	expression tag	UNP G3QPX8
A	177	HIS	-	expression tag	UNP G3QPX8
A	178	PRO	-	expression tag	UNP G3QPX8
A	179	GLN	-	expression tag	UNP G3QPX8
A	180	PHE	-	expression tag	UNP G3QPX8
A	181	GLU	-	expression tag	UNP G3QPX8
A	182	LYS	-	expression tag	UNP G3QPX8
A	183	ILE	-	expression tag	UNP G3QPX8
A	184	GLU	-	expression tag	UNP G3QPX8
A	185	GLY	-	expression tag	UNP G3QPX8
A	186	ARG	-	expression tag	UNP G3QPX8
A	187	MET	-	expression tag	UNP G3QPX8
B	173	ALA	-	expression tag	UNP G3QPX8
B	174	SER	-	expression tag	UNP G3QPX8
B	175	TRP	-	expression tag	UNP G3QPX8
B	176	SER	-	expression tag	UNP G3QPX8
B	177	HIS	-	expression tag	UNP G3QPX8
B	178	PRO	-	expression tag	UNP G3QPX8

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Chain	Residue	Modelled	Actual	Comment	Reference
B	179	GLN	-	expression tag	UNP G3QPX8
B	180	PHE	-	expression tag	UNP G3QPX8
B	181	GLU	-	expression tag	UNP G3QPX8
B	182	LYS	-	expression tag	UNP G3QPX8
B	183	ILE	-	expression tag	UNP G3QPX8
B	184	GLU	-	expression tag	UNP G3QPX8
B	185	GLY	-	expression tag	UNP G3QPX8
B	186	ARG	-	expression tag	UNP G3QPX8
B	187	MET	-	expression tag	UNP G3QPX8
C	173	ALA	-	expression tag	UNP G3QPX8
C	174	SER	-	expression tag	UNP G3QPX8
C	175	TRP	-	expression tag	UNP G3QPX8
C	176	SER	-	expression tag	UNP G3QPX8
C	177	HIS	-	expression tag	UNP G3QPX8
C	178	PRO	-	expression tag	UNP G3QPX8
C	179	GLN	-	expression tag	UNP G3QPX8
C	180	PHE	-	expression tag	UNP G3QPX8
C	181	GLU	-	expression tag	UNP G3QPX8
C	182	LYS	-	expression tag	UNP G3QPX8
C	183	ILE	-	expression tag	UNP G3QPX8
C	184	GLU	-	expression tag	UNP G3QPX8
C	185	GLY	-	expression tag	UNP G3QPX8
C	186	ARG	-	expression tag	UNP G3QPX8
C	187	MET	-	expression tag	UNP G3QPX8
D	173	ALA	-	expression tag	UNP G3QPX8
D	174	SER	-	expression tag	UNP G3QPX8
D	175	TRP	-	expression tag	UNP G3QPX8
D	176	SER	-	expression tag	UNP G3QPX8
D	177	HIS	-	expression tag	UNP G3QPX8
D	178	PRO	-	expression tag	UNP G3QPX8
D	179	GLN	-	expression tag	UNP G3QPX8
D	180	PHE	-	expression tag	UNP G3QPX8
D	181	GLU	-	expression tag	UNP G3QPX8
D	182	LYS	-	expression tag	UNP G3QPX8
D	183	ILE	-	expression tag	UNP G3QPX8
D	184	GLU	-	expression tag	UNP G3QPX8
D	185	GLY	-	expression tag	UNP G3QPX8
D	186	ARG	-	expression tag	UNP G3QPX8
D	187	MET	-	expression tag	UNP G3QPX8

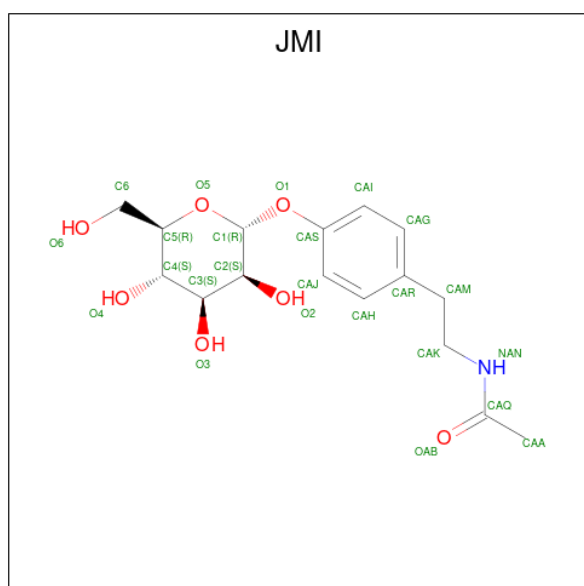
- Molecule 2 is a protein called SER-TRP.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	2	Total	C	N	O	0	0	0
			20	14	3	3			

- 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				

- Molecule 4 is {N}-[2-[4-[(2 {R},3 {S},4 {S},5 {S},6 {R})-6-(hydroxymethyl)-3,4,5-tris(oxidanyl)oxan-2-yl]oxyphenyl]ethyl]ethanamide (CCD ID: JMI) (formula: C₁₆H₂₃NO₇) (labeled as "Ligand of Interest" by depositor).

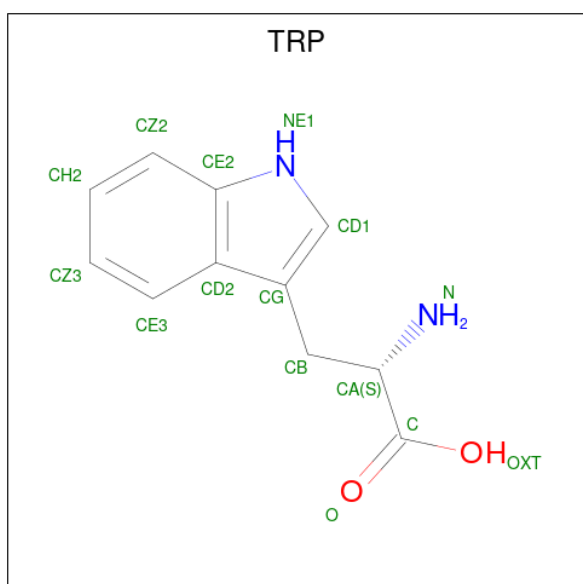


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			24	16	1	7		
4	B	1	Total	C	N	O	0	0
			24	16	1	7		
4	C	1	Total	C	N	O	0	0
			24	16	1	7		
4	D	1	Total	C	N	O	0	0
			24	16	1	7		

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total Cl 1 1	0	0
5	B	1	Total Cl 1 1	0	0
5	C	1	Total Cl 1 1	0	0
5	D	1	Total Cl 1 1	0	0

- Molecule 6 is TRYPTOPHAN (CCD ID: TRP) (formula: C₁₁H₁₂N₂O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total C N O 14 11 2 1	0	0
6	D	1	Total C N O 14 11 2 1	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	150	Total O 150 150	0	0
7	B	166	Total O 166 166	0	0
7	C	160	Total O 160 160	0	0

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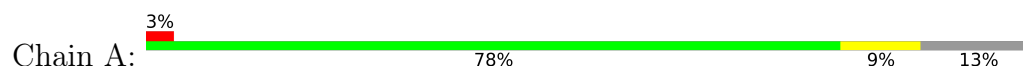
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	184	Total 184	O 184	0	0

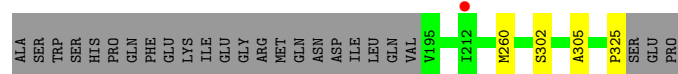
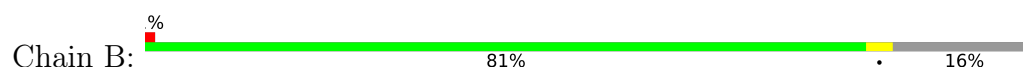
3 Residue-property plots [i](#)

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.

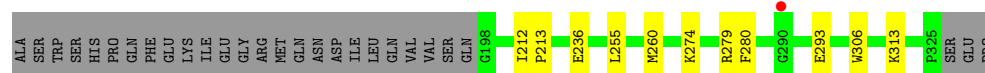
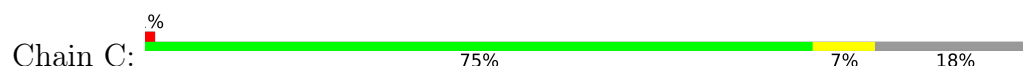
- Molecule 1: CD207 molecule



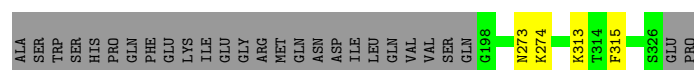
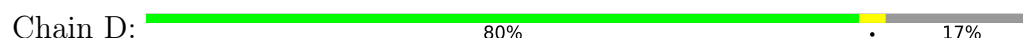
- Molecule 1: CD207 molecule



- Molecule 1: CD207 molecule



- Molecule 1: CD207 molecule



- Molecule 2: SER-TRP



4 Data and refinement statistics

Property	Value	Source
Space group	P 42	Depositor
Cell constants a, b, c, α , β , γ	80.03Å 80.03Å 90.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.94 – 1.60 19.94 – 1.60	Depositor EDS
% Data completeness (in resolution range)	100.0 (19.94-1.60) 99.9 (19.94-1.60)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.00 (at 1.60Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.182 , 0.213 0.183 , 0.214	Depositor DCC
R_{free} test set	3921 reflections (5.25%)	wwPDB-VP
Wilson B-factor (Å ²)	19.0	Xtriage
Anisotropy	0.129	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.035 for h,-k,-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	5160	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 13.68% 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: JMI, CA, CL

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	0.32	0/1157	0.53	0/1576
1	B	0.30	0/1111	0.55	0/1513
1	C	0.30	0/1105	0.52	0/1504
1	D	0.30	0/1131	0.53	0/1535
2	E	0.21	0/21	0.37	0/28
All	All	0.30	0/4525	0.53	0/6156

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1118	0	1043	10	0
1	B	1072	0	1001	3	0
1	C	1066	0	987	7	0
1	D	1092	0	1026	4	0
2	E	20	0	14	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	1	0	0	0	0
4	A	24	0	0	0	0
4	B	24	0	0	1	0
4	C	24	0	0	1	0
4	D	24	0	0	0	0
5	A	1	0	0	1	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
6	C	14	0	9	0	0
6	D	14	0	9	0	0
7	A	150	0	0	3	0
7	B	166	0	0	1	0
7	C	160	0	0	0	0
7	D	184	0	0	2	0
All	All	5160	0	4089	22	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 (22) 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)
4:B:402:JMI:CAQ	7:B:544:HOH:O	2.49	0.59
1:D:273:ASN:ND2	7:D:501:HOH:O	2.36	0.57
1:B:325:PRO:HD2	1:C:274:LYS:HD3	1.86	0.57
1:A:190:ASP:HB3	1:A:193:GLN:HB2	1.89	0.54
1:A:227:ASN:HB2	1:B:260:MET:SD	2.50	0.52
1:C:236:GLU:HB2	1:C:279:ARG:NH1	2.26	0.50
1:A:325:PRO:HG2	1:D:274[A]:LYS:HD2	1.93	0.50
1:A:212:ILE:HG12	5:A:403:CL:CL	2.50	0.49
1:A:190:ASP:N	7:A:508:HOH:O	2.46	0.48
1:D:313[A]:LYS:NZ	7:D:502:HOH:O	2.37	0.48
1:B:302:SER:O	1:B:305:ALA:HB2	2.14	0.47
1:A:276:GLN:NE2	7:A:502:HOH:O	2.28	0.45
1:C:260:MET:HE3	1:C:260:MET:HB3	1.77	0.45
1:C:279:ARG:HG3	1:C:280:PHE:CD1	2.51	0.45
1:A:263:ASP:HB3	7:A:560:HOH:O	2.17	0.44
1:D:313[B]:LYS:HD2	1:D:315:PHE:CZ	2.52	0.44
1:A:190:ASP:O	1:A:194:VAL:HG23	2.19	0.43
1:A:302:SER:O	1:A:305:ALA:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:293:GLU:OE2	4:C:403:JMI:O3	2.37	0.42
1:C:255:LEU:HD11	1:C:306:TRP:CE3	2.55	0.42
1:A:255:LEU:HD11	1:A:306:TRP:CE3	2.55	0.41
1:C:212:ILE:HG23	1:C:213:PRO:HD2	2.03	0.41

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	136/156 (87%)	134 (98%)	2 (2%)	0	100	100
1	B	130/156 (83%)	126 (97%)	4 (3%)	0	100	100
1	C	129/156 (83%)	127 (98%)	2 (2%)	0	100	100
1	D	132/156 (85%)	130 (98%)	2 (2%)	0	100	100
All	All	527/624 (84%)	517 (98%)	10 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	120/136 (88%)	118 (98%)	2 (2%)	53	30
1	B	114/136 (84%)	114 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	113/136 (83%)	112 (99%)	1 (1%)	70	55
1	D	116/136 (85%)	116 (100%)	0	100	100
2	E	2/2 (100%)	2 (100%)	0	100	100
All	All	465/546 (85%)	462 (99%)	3 (1%)	76	66

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	261	GLU
1	A	274	LYS
1	C	313	LYS

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

Mol	Chain	Res	Type
1	A	227	ASN
1	C	227	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 14 ligands modelled in this entry, 8 are monoatomic - leaving 6 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	JMI	B	402	3	25,25,25	1.13	2 (8%)	34,34,34	1.51	3 (8%)
4	JMI	C	403	3	25,25,25	1.05	1 (4%)	34,34,34	0.95	1 (2%)
4	JMI	D	403	3	25,25,25	1.00	1 (4%)	34,34,34	1.53	1 (2%)
4	JMI	A	402	3	25,25,25	1.22	2 (8%)	34,34,34	1.65	3 (8%)
6	TRP	D	401	-	14,15,16	0.54	0	15,20,22	0.45	0
6	TRP	C	401	-	14,15,16	0.59	0	15,20,22	0.43	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	JMI	B	402	3	-	1/12/32/32	0/2/2/2
4	JMI	C	403	3	-	5/12/32/32	0/2/2/2
4	JMI	D	403	3	-	2/12/32/32	0/2/2/2
4	JMI	A	402	3	-	2/12/32/32	0/2/2/2
6	TRP	D	401	-	-	0/5/6/8	0/2/2/2
6	TRP	C	401	-	-	2/5/6/8	0/2/2/2

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	402	JMI	CAM-CAR	-4.39	1.39	1.51
4	B	402	JMI	CAM-CAR	-4.34	1.39	1.51
4	C	403	JMI	CAM-CAR	-4.14	1.40	1.51
4	D	403	JMI	CAM-CAR	-4.10	1.40	1.51
4	A	402	JMI	O1-C1	3.24	1.46	1.41
4	B	402	JMI	O1-C1	2.47	1.45	1.41

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	403	JMI	CAS-O1-C1	-7.82	106.80	117.82
4	A	402	JMI	CAS-O1-C1	-7.81	106.82	117.82
4	B	402	JMI	CAS-O1-C1	-6.42	108.77	117.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	402	JMI	O1-C1-C2	3.65	112.48	107.16
4	C	403	JMI	CAS-O1-C1	-3.39	113.04	117.82
4	A	402	JMI	O1-C1-C2	3.27	111.92	107.16
4	B	402	JMI	C1-O5-C5	-2.57	108.70	113.72
4	A	402	JMI	CAK-CAM-CAR	-2.24	107.79	112.83

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	403	JMI	NAN-CAK-CAM-CAR
4	C	403	JMI	CAA-CAQ-NAN-CAK
4	C	403	JMI	OAB-CAQ-NAN-CAK
4	A	402	JMI	CAI-CAS-O1-C1
4	A	402	JMI	CAJ-CAS-O1-C1
4	C	403	JMI	CAI-CAS-O1-C1
4	C	403	JMI	CAJ-CAS-O1-C1
4	D	403	JMI	CAI-CAS-O1-C1
6	C	401	TRP	C-CA-CB-CG
4	B	402	JMI	NAN-CAK-CAM-CAR
4	D	403	JMI	CAJ-CAS-O1-C1
6	C	401	TRP	CA-CB-CG-CD1

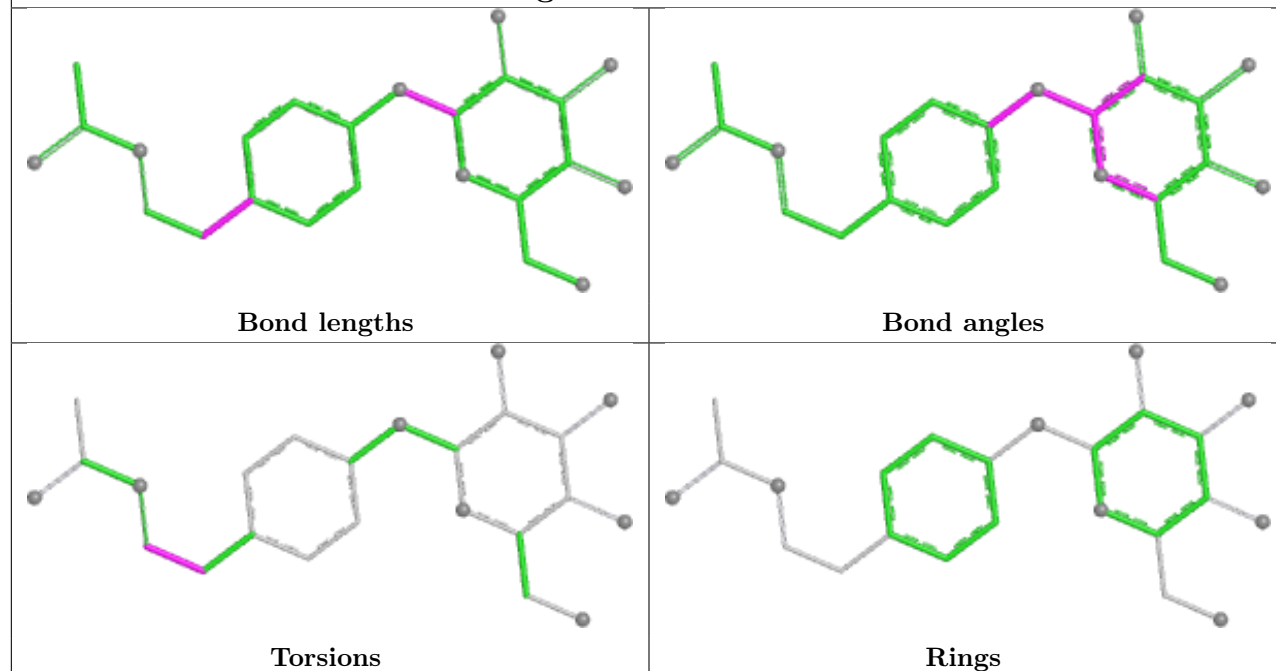
There are no ring outliers.

2 monomers are involved in 2 short contacts:

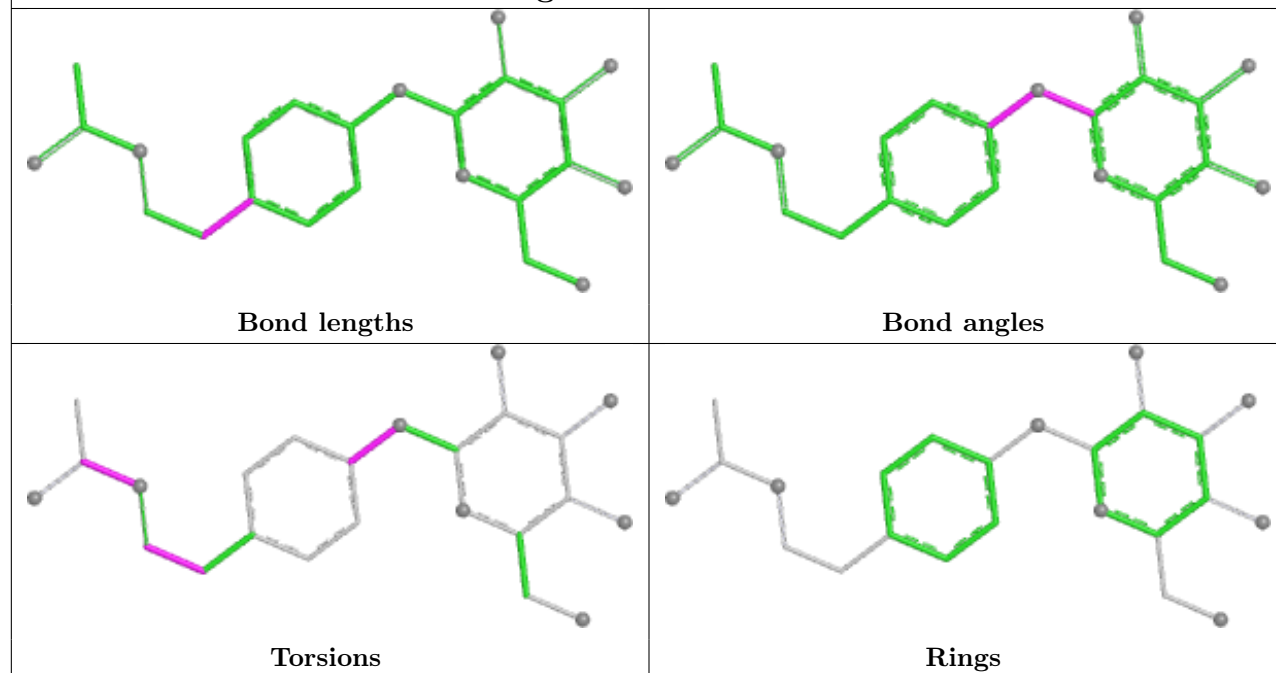
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	402	JMI	1	0
4	C	403	JMI	1	0

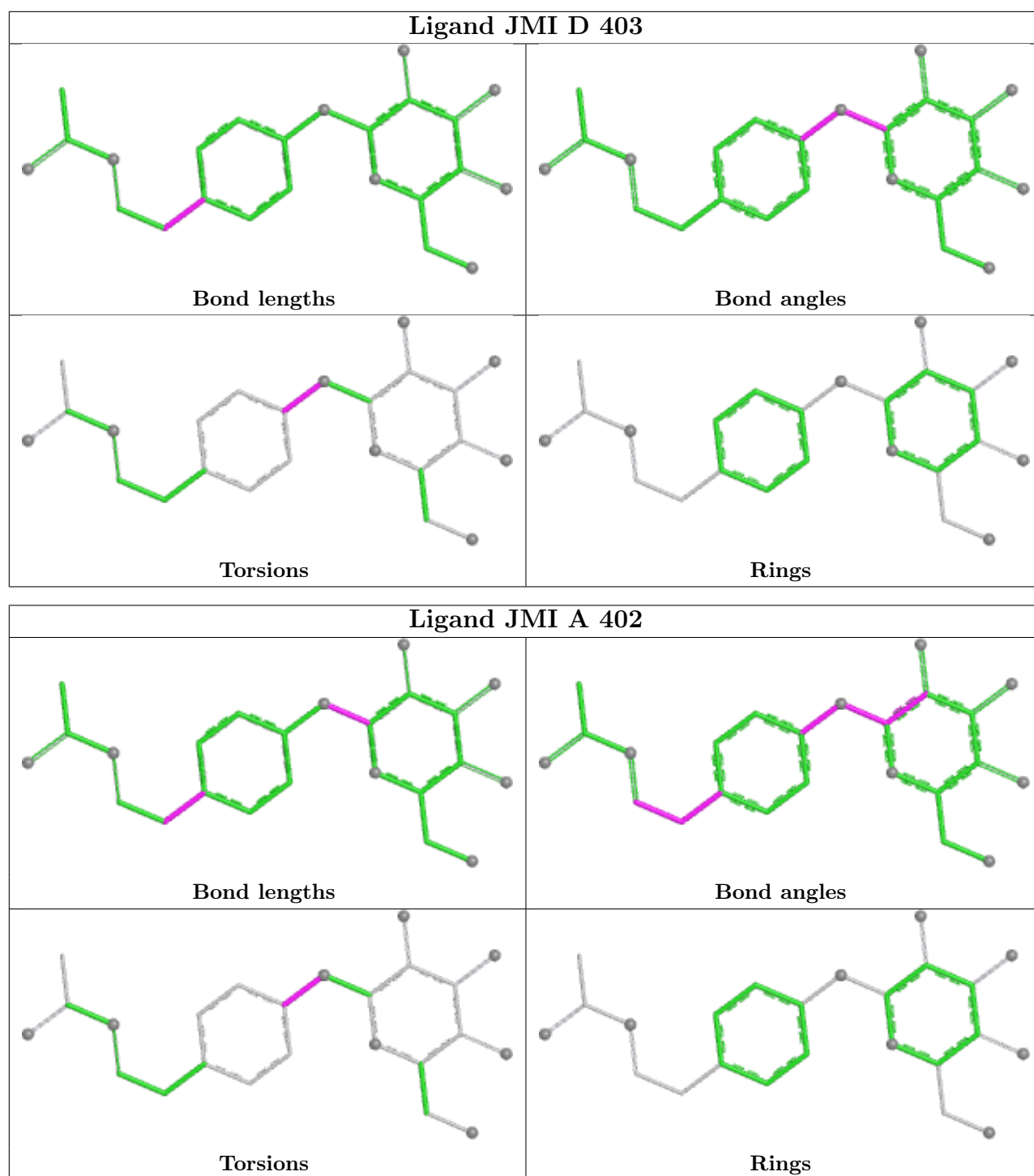
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 JMI B 402



Ligand JMI C 403





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	136/156 (87%)	0.21	4 (2%) 53 56	11, 23, 38, 53	2 (1%)
1	B	131/156 (83%)	0.22	1 (0%) 82 86	13, 22, 39, 57	2 (1%)
1	C	128/156 (82%)	-0.05	1 (0%) 82 86	10, 21, 34, 48	3 (2%)
1	D	129/156 (82%)	-0.27	0 100 100	8, 18, 30, 53	5 (3%)
2	E	2/2 (100%)	2.10	1 (50%) 0 0	43, 43, 43, 51	0
All	All	526/626 (84%)	0.04	7 (1%) 75 79	8, 21, 38, 57	12 (2%)

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	400	TRP	2.9
1	C	290	GLY	2.3
1	B	212	ILE	2.3
1	A	190	ASP	2.2
1	A	227	ASN	2.1
1	A	290	GLY	2.0
1	A	283	PRO	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

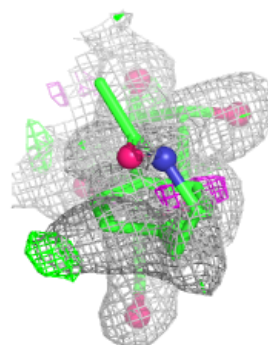
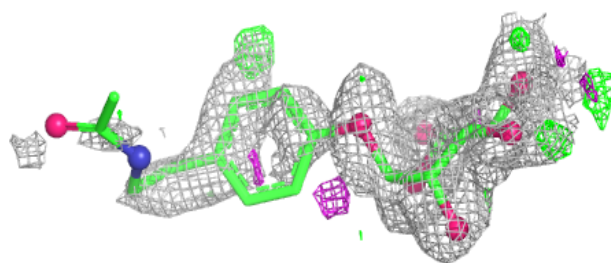
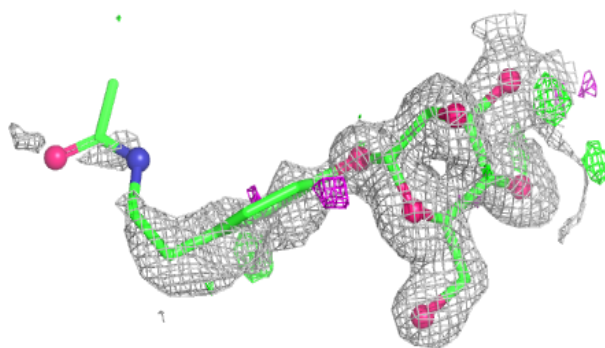
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	TRP	C	401	14/15	0.76	0.13	26,39,63,66	0
4	JMI	B	402	24/24	0.82	0.12	24,42,58,61	24
6	TRP	D	401	14/15	0.83	0.13	23,37,60,61	0
4	JMI	C	403	24/24	0.87	0.11	20,33,42,45	24
4	JMI	A	402	24/24	0.88	0.11	25,33,39,46	0
4	JMI	D	403	24/24	0.88	0.10	17,31,42,47	24
5	CL	A	403	1/1	0.90	0.11	42,42,42,42	1
3	CA	A	401	1/1	0.92	0.08	23,23,23,23	0
3	CA	C	402	1/1	0.95	0.05	20,20,20,20	0
5	CL	B	403	1/1	0.95	0.06	33,33,33,33	1
3	CA	B	401	1/1	0.96	0.08	24,24,24,24	0
5	CL	D	404	1/1	0.96	0.06	30,30,30,30	1
5	CL	C	404	1/1	0.97	0.05	37,37,37,37	1
3	CA	D	402	1/1	0.99	0.02	17,17,17,17	0

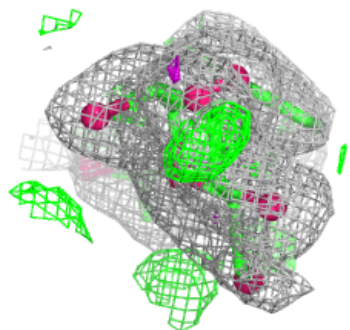
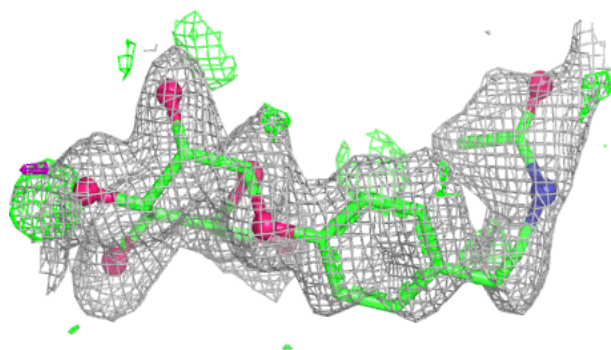
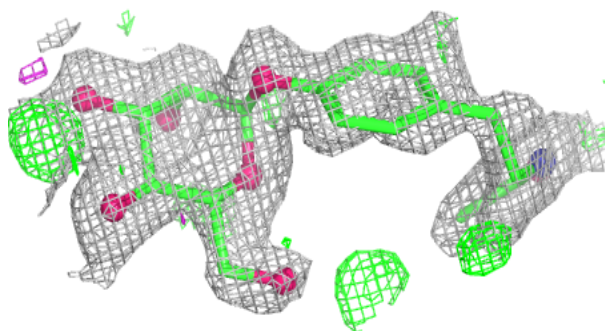
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around JMI B 402:

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

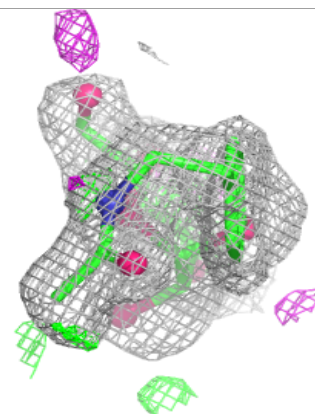
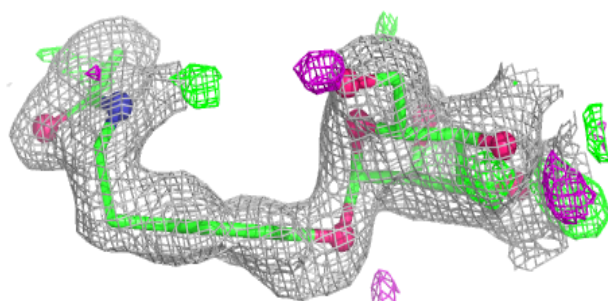
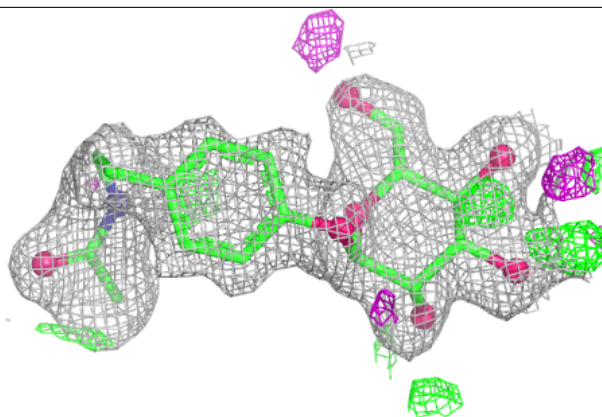
**Electron density around JMI C 403:**

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

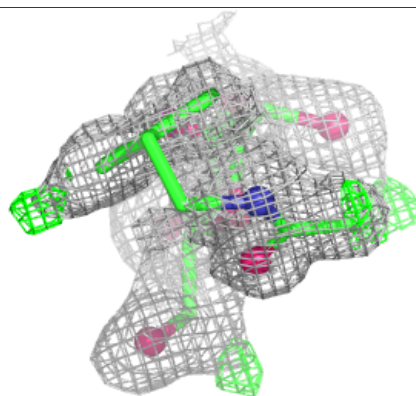
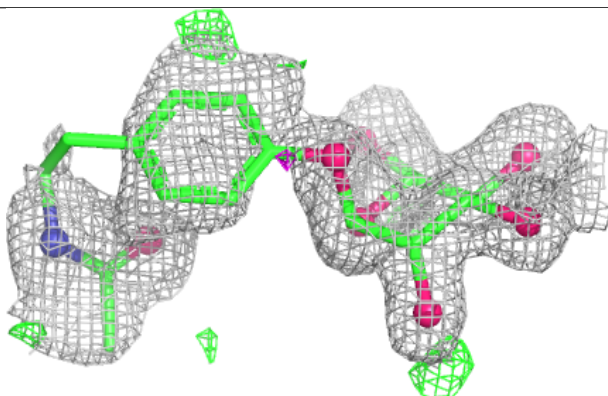
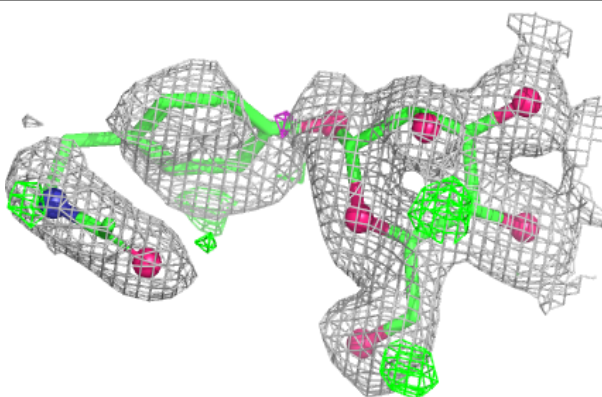


Electron density around JMI A 402:

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

**Electron density around JMI D 403:**

$2mF_o-DF_c$ (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.