



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 12:09 PM UTC

PDB ID : 6MUG / pdb_00006mug
Title : Crystal Structure of HIV-1 B41 SOSIP.664 Prefusion Env Trimer Bound to Small Molecule HIV-1 Entry Inhibitor BMS-386150 in Complex with Human Antibodies 3H109L and 35O22 at 3.8 Angstrom
Authors : Lai, Y.-T.; Kwong, P.D.
Deposited on : 2018-10-23
Resolution : 2.95 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	:	NOT EXECUTED
Xtriage (Phenix)	:	2.0
EDS	:	NOT EXECUTED
Buster-report	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

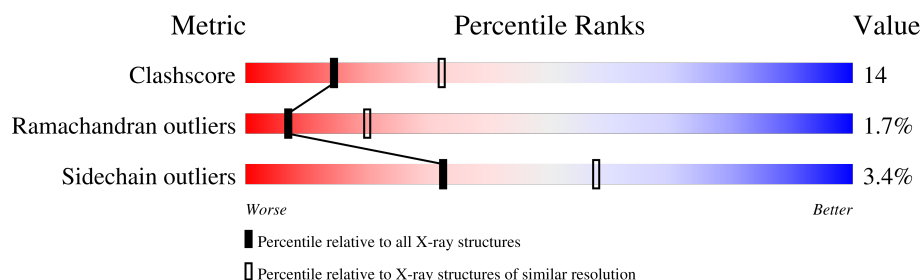
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.95 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))
Clashscore	190562	1157 (2.98-2.94)
Ramachandran outliers	187476	1101 (2.98-2.94)
Sidechain outliers	187428	1101 (2.98-2.94)



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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	B	153	
2	D	134	
3	E	114	
4	G	489	
5	H	244	
6	L	217	
7	A	6	
8	C	2	

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Mol	Chain	Length	Quality of chain
8	F	2	 50% 50%
9	I	10	 90% 10%

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 9963 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 Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	123	Total	C	N	O	S	0	0	0
			994	636	167	184	7			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	559	PRO	ILE	engineered mutation	UNP B3UEZ6
B	605	CYS	THR	engineered mutation	UNP B3UEZ6

- Molecule 2 is a protein called 35O22 scFv heavy chain portion.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	128	Total	C	N	O	S	0	0	0
			994	628	169	192	5			

- Molecule 3 is a protein called 35O22 scFv light chain portion.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	112	Total	C	N	O	S	0	0	0
			851	533	141	171	6			

- Molecule 4 is a protein called Envelope glycoprotein gp160.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	G	424	Total	C	N	O	S	0	0	0
			3330	2101	587	616	26			

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	501	CYS	ALA	conflict	UNP B3UES2
G	508	ARG	-	expression tag	UNP B3UES2

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Chain	Residue	Modelled	Actual	Comment	Reference
G	509	ARG	-	expression tag	UNP B3UES2
G	510	ARG	-	expression tag	UNP B3UES2
G	511	ARG	-	expression tag	UNP B3UES2
G	512	ARG	-	expression tag	UNP B3UES2
G	513	ARG	-	expression tag	UNP B3UES2

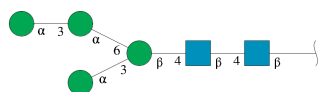
- Molecule 5 is a protein called 3H109L Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	H	227	Total	C	N	O	S	0	0	0
			1721	1096	279	340	6			

- Molecule 6 is a protein called 3H109L Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	L	211	Total	C	N	O	S	0	0	0
			1604	1009	276	312	7			

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	A	6	Total	C	N	O	0	0	0
			72	40	2	30			

- Molecule 8 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



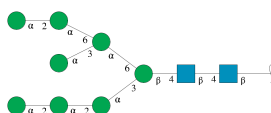
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
8	C	2	Total	C	N	O	0	0	0
			28	16	2	10			

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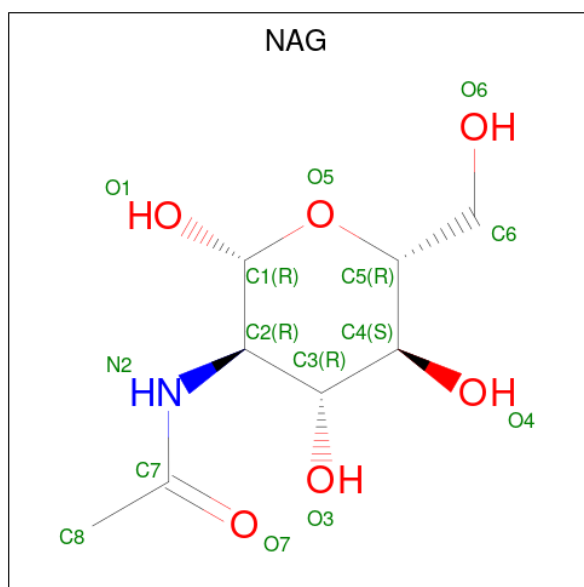
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
8	F	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 9 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
9	I	10	Total	C	N	O	0	0	0
			116	64	2	50			

- Molecule 10 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



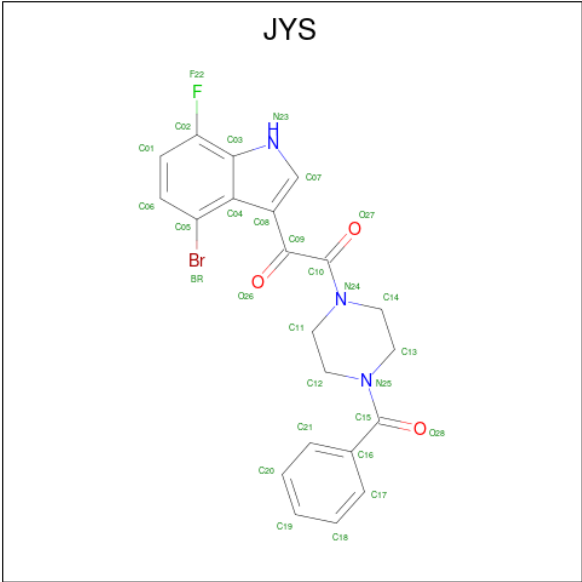
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
10	B	1	Total	C	N	O	0	0
			14	8	1	5		
10	B	1	Total	C	N	O	0	0
			14	8	1	5		

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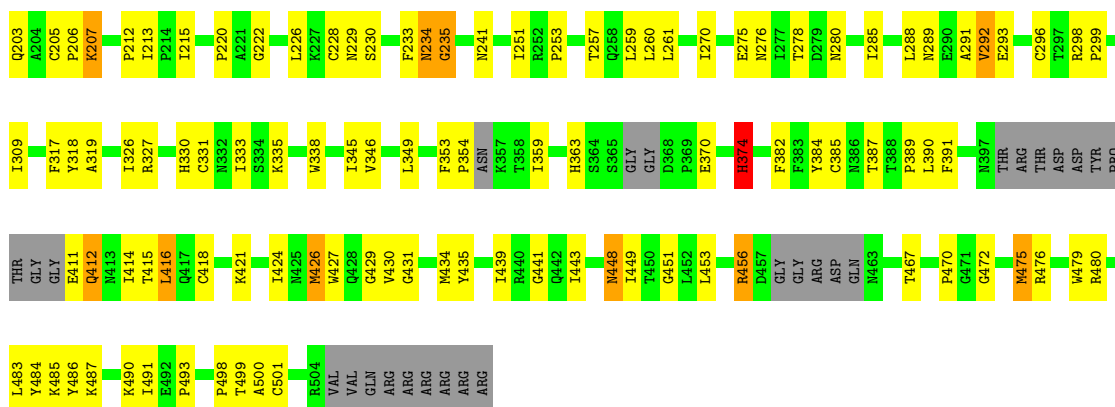
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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		
10	G	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 11 is 1-[4-(benzenecarbonyl)piperazin-1-yl]-2-(4-bromo-7-fluoro-1H-indol-3-yl)ethane-1,2-dione (CCD ID: JYS) (formula: C₂₁H₁₇BrFN₃O₃) (labeled as "Ligand of Interest" by depositor).

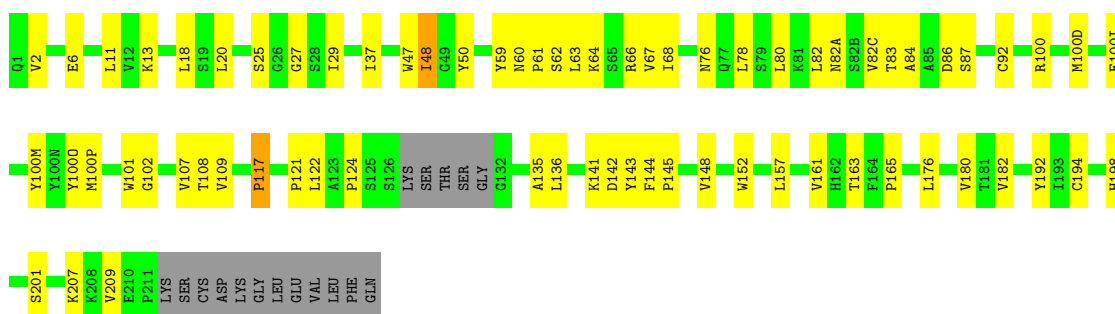


Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	Br	C	F	N	O		
11	G	1	29	1	21	1	3	3	0	0



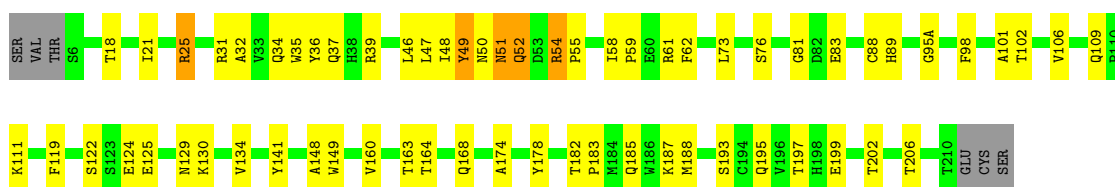
• Molecule 5: 3H109L Fab heavy chain

Chain H: 64% 28% 7%



• Molecule 6: 3H109L Fab light chain

Chain L: 68% 27% 5%



• Molecule 7: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain A: 33% 67%



• Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C: 100%


MAG1
MAG2

- Molecule 8: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F:  50% 50%

MAG1
MAG2

- Molecule 9: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  90% 10%

MAG1
MAG2
BMA3
MAN4
MAN5
MAN6
MAN7
MAN8
MAN9
MAN10

4 Data and refinement statistics

EDS was not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 63	Depositor
Cell constants a, b, c, α , β , γ	132.76Å 132.76Å 313.40Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	41.88 – 2.95	Depositor
% Data completeness (in resolution range)	30.2 (41.88-2.95)	Depositor
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.41 (at 2.77Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.230 , 0.289	Depositor
Wilson B-factor (Å ²)	33.0	Xtriage
Anisotropy	0.146	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	0.095 for h,-h-k,-l	Xtriage
Total number of atoms	9963	wwPDB-VP
Average B, all atoms (Å ²)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.12% 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: BMA, NAG, JYS, MAN

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	B	0.16	0/1013	0.37	0/1374
2	D	0.16	0/1021	0.36	0/1390
3	E	0.15	0/875	0.40	0/1195
4	G	0.18	0/3399	0.41	0/4617
5	H	0.16	0/1764	0.37	0/2405
6	L	0.17	0/1647	0.41	0/2247
All	All	0.17	0/9719	0.39	0/13228

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	B	994	0	980	27	0
2	D	994	0	953	29	0
3	E	851	0	801	20	0
4	G	3330	0	3268	114	0
5	H	1721	0	1690	49	0
6	L	1604	0	1553	47	0
7	A	72	0	61	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	C	28	0	25	0	0
8	F	28	0	25	1	0
9	I	116	0	97	2	0
10	B	28	0	26	0	0
10	G	168	0	156	3	0
11	G	29	0	0	2	0
All	All	9963	0	9635	274	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 14.

All (274) 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:G:335:LYS:HD2	4:G:412:GLN:HB3	1.65	0.77
4:G:52:LEU:H	4:G:103:GLN:HE22	1.32	0.75
6:L:34:GLN:HB2	6:L:89:HIS:HB3	1.69	0.74
1:B:651:ILE:HG13	1:B:655:LYS:HE3	1.68	0.74
1:B:523:LEU:HD12	1:B:540:GLN:HG2	1.69	0.74
6:L:34:GLN:HG3	6:L:49:TYR:HA	1.70	0.73
4:G:113:ASP:OD1	11:G:633:JYS:N23	2.22	0.71
4:G:391:PHE:CD1	4:G:470:PRO:HG2	2.25	0.71
5:H:59:TYR:HB2	5:H:64:LYS:HD2	1.73	0.71
6:L:54:ARG:NH2	6:L:62:PHE:O	2.25	0.70
4:G:94:ASN:HB3	4:G:97:LYS:HG2	1.74	0.69
4:G:291:ALA:HB1	4:G:448:ASN:HB3	1.75	0.69
5:H:66:ARG:NH2	5:H:86:ASP:OD2	2.26	0.68
4:G:270:ILE:HG22	4:G:289:ASN:H	1.58	0.67
4:G:363:HIS:HA	4:G:391:PHE:CE2	2.29	0.67
1:B:585:ARG:NH2	4:G:491:ILE:O	2.26	0.67
2:D:68:ASN:HB3	2:D:81:GLU:HB2	1.77	0.65
4:G:205:CYS:HB3	4:G:207:LYS:HD2	1.78	0.65
2:D:36:TRP:HB3	2:D:48:MET:HE3	1.78	0.65
1:B:629:MET:HG3	4:G:44:VAL:HG23	1.78	0.64
9:I:1:NAG:H83	9:I:1:NAG:H3	1.79	0.64
4:G:363:HIS:HA	4:G:391:PHE:HE2	1.61	0.63
5:H:136:LEU:HD13	5:H:209:VAL:HG21	1.80	0.63
5:H:117:PRO:HB3	5:H:143:TYR:HB3	1.81	0.62
3:E:37:GLN:HB2	3:E:47:ILE:HD11	1.80	0.62
1:B:544:LEU:HD12	4:G:222:GLY:HA2	1.81	0.62
5:H:66:ARG:HH21	5:H:82:LEU:HD21	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:260:LEU:HD12	4:G:451:GLY:HA3	1.82	0.61
4:G:201:ILE:HD11	4:G:435:TYR:HB2	1.81	0.61
2:D:109:LEU:HG	2:D:110:THR:H	1.65	0.61
4:G:52:LEU:N	4:G:103:GLN:HE22	1.99	0.61
1:B:532:ALA:HA	1:B:535:MET:HE2	1.80	0.61
7:A:2:NAG:H3	7:A:2:NAG:H83	1.83	0.60
4:G:476:ARG:HA	4:G:479:TRP:CD1	2.37	0.60
5:H:18:LEU:HB2	5:H:82(C):VAL:HG11	1.83	0.60
4:G:54:CYS:SG	4:G:215:ILE:HG13	2.42	0.60
3:E:19:VAL:HG12	3:E:20:THR:H	1.67	0.60
1:B:519:ILE:HG22	1:B:520:LEU:H	1.66	0.60
2:D:94:LYS:HD3	2:D:102:LEU:HB3	1.82	0.60
4:G:42:VAL:HG23	4:G:44:VAL:HG12	1.83	0.59
4:G:387:THR:HG22	4:G:390:LEU:HD12	1.84	0.59
4:G:456:ARG:HH11	4:G:456:ARG:HB2	1.67	0.59
6:L:185:GLN:HG2	6:L:188:MET:HE2	1.84	0.58
4:G:292:VAL:HG13	4:G:449:ILE:HG13	1.84	0.58
4:G:54:CYS:SG	4:G:55:ALA:N	2.76	0.58
2:D:57:LYS:HE2	2:D:59:LEU:HD23	1.85	0.58
4:G:270:ILE:HG22	4:G:289:ASN:N	2.18	0.58
4:G:415:THR:HG21	5:H:100(D):MET:HE1	1.86	0.58
4:G:98:ASN:ND2	4:G:486:TYR:O	2.37	0.57
6:L:18:THR:HG22	6:L:76:SER:HA	1.87	0.57
6:L:21:ILE:HG23	6:L:102:THR:HG21	1.87	0.57
4:G:70:ALA:HA	4:G:72:HIS:CE1	2.40	0.57
4:G:228:CYS:SG	4:G:230:SER:OG	2.63	0.57
4:G:285:ILE:HG12	4:G:453:LEU:HD22	1.87	0.56
5:H:29:ILE:HD11	5:H:78:LEU:HD23	1.85	0.56
4:G:426:MET:HE3	4:G:431:GLY:HA3	1.86	0.56
4:G:439:ILE:HB	4:G:443:ILE:HD11	1.87	0.56
5:H:6:GLU:N	5:H:6:GLU:OE1	2.38	0.56
1:B:571:TRP:CE3	1:B:571:TRP:HA	2.41	0.56
4:G:131:CYS:HA	4:G:157:CYS:HA	1.86	0.56
4:G:69:TRP:NE1	4:G:112:TRP:HE1	2.04	0.56
6:L:49:TYR:HD1	6:L:49:TYR:H	1.54	0.56
2:D:57:LYS:HE3	2:D:69:MET:HE2	1.88	0.56
5:H:82:LEU:HD23	5:H:82(A):ASN:N	2.22	0.56
5:H:157:LEU:HD21	5:H:180:VAL:HG11	1.88	0.56
6:L:148:ALA:HB3	6:L:195:GLN:HB2	1.87	0.56
4:G:234:ASN:OD1	10:G:611:NAG:N2	2.39	0.55
5:H:27:GLY:O	5:H:76:ASN:ND2	2.38	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:70:ALA:C	4:G:72:HIS:H	2.14	0.55
4:G:69:TRP:HA	4:G:111:LEU:HB3	1.89	0.55
6:L:39:ARG:NH1	6:L:81:GLY:O	2.37	0.55
1:B:526:ALA:HA	4:G:43:PRO:HB2	1.89	0.55
6:L:31:ARG:O	6:L:51:ASN:ND2	2.33	0.55
1:B:522:PHE:CE1	1:B:543:LEU:HB2	2.41	0.55
4:G:387:THR:HB	4:G:391:PHE:CE1	2.42	0.54
5:H:11:LEU:HA	5:H:108:THR:O	2.07	0.54
6:L:134:VAL:HG12	6:L:178:TYR:CD2	2.43	0.54
6:L:122:SER:HB3	6:L:125:GLU:HG2	1.90	0.54
3:E:84:THR:OG1	3:E:85:THR:N	2.42	0.53
2:D:72(B):GLU:HB2	2:D:74:SER:HB2	1.89	0.53
4:G:91:GLU:OE1	4:G:487:LYS:NZ	2.39	0.53
4:G:389:PRO:HB3	10:G:630:NAG:H61	1.91	0.53
6:L:55:PRO:HD2	6:L:58:ILE:HG13	1.89	0.53
4:G:104:MET:HE1	4:G:251:ILE:HG21	1.91	0.53
2:D:96:LEU:HG	2:D:97:LEU:HG	1.91	0.53
4:G:333:ILE:HD12	4:G:338:TRP:HB2	1.91	0.52
4:G:69:TRP:HE1	4:G:112:TRP:HE1	1.58	0.52
4:G:298:ARG:NH2	4:G:441:GLY:O	2.42	0.52
5:H:11:LEU:HD12	5:H:145:PRO:HD3	1.91	0.52
2:D:57:LYS:HE3	2:D:69:MET:HB3	1.91	0.52
5:H:182:VAL:HG11	5:H:192:TYR:HE2	1.75	0.52
6:L:50:ASN:O	6:L:52:GLN:N	2.43	0.52
2:D:100(E):LEU:HD12	2:D:100(F):PRO:HD2	1.91	0.52
4:G:215:ILE:HG22	4:G:251:ILE:O	2.10	0.51
5:H:66:ARG:NH2	5:H:82:LEU:HD21	2.25	0.51
2:D:30:ASN:HA	2:D:52(A):PRO:HB2	1.92	0.51
3:E:19:VAL:HG12	3:E:20:THR:N	2.25	0.51
4:G:91:GLU:HG3	4:G:226:LEU:HD13	1.91	0.51
6:L:197:THR:HA	6:L:202:THR:HA	1.93	0.51
1:B:571:TRP:HA	1:B:571:TRP:HE3	1.76	0.51
1:B:522:PHE:CE1	1:B:540:GLN:HA	2.46	0.50
2:D:38:ARG:NH1	2:D:46:GLU:OE2	2.44	0.50
6:L:83:GLU:HG3	6:L:106:VAL:HG23	1.93	0.50
1:B:576:LEU:HD12	1:B:579:ARG:HE	1.76	0.50
4:G:184:LEU:HD11	4:G:192:ARG:HB3	1.92	0.50
2:D:2:GLY:O	2:D:102:LEU:HD21	2.12	0.50
4:G:349:LEU:O	4:G:353:PHE:HB2	2.12	0.50
1:B:594:GLY:HA2	1:B:599:SER:HB3	1.94	0.49
5:H:83:THR:O	5:H:109:VAL:HG21	2.11	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:195:ASN:ND2	4:G:201:ILE:HB	2.27	0.49
6:L:119:PHE:HB2	6:L:134:VAL:CG2	2.41	0.49
4:G:259:LEU:HD22	4:G:374:HIS:HD2	1.78	0.49
1:B:658:GLN:O	1:B:662:GLU:HG3	2.12	0.49
3:E:83:GLU:HG2	3:E:106:VAL:HG12	1.94	0.49
5:H:100(O):TYR:HB3	6:L:34:GLN:HE21	1.77	0.49
11:G:633:JYS:BR	11:G:633:JYS:C10	3.16	0.49
3:E:49:TYR:HD2	3:E:50:GLU:HG3	1.78	0.49
1:B:630:GLN:HG2	2:D:72(H):PHE:CE1	2.47	0.49
4:G:374:HIS:HB2	4:G:387:THR:HG21	1.94	0.49
4:G:387:THR:O	4:G:390:LEU:HB2	2.12	0.49
7:A:1:NAG:H61	7:A:2:NAG:H82	1.94	0.49
5:H:18:LEU:HD11	5:H:107:VAL:HG11	1.94	0.48
5:H:100(P):MET:O	6:L:46:LEU:HB2	2.12	0.48
4:G:333:ILE:HG13	4:G:414:ILE:HB	1.95	0.48
6:L:109:GLN:HB2	6:L:141:TYR:CE1	2.48	0.48
2:D:29:PHE:CE2	2:D:52(A):PRO:HB3	2.49	0.48
3:E:61:ARG:HB3	3:E:76:SER:O	2.13	0.48
4:G:122:LEU:HD11	4:G:203:GLN:HB2	1.95	0.48
4:G:230:SER:OG	4:G:233:PHE:HB2	2.13	0.48
4:G:484:TYR:CE1	4:G:485:LYS:HG3	2.49	0.48
6:L:182:THR:HG23	6:L:185:GLN:H	1.79	0.48
4:G:389:PRO:HG2	4:G:416:LEU:HD22	1.95	0.47
5:H:100(D):MET:H	5:H:100(I):GLU:HG3	1.79	0.47
4:G:257:THR:HG21	4:G:370:GLU:O	2.14	0.47
5:H:180:VAL:HG12	5:H:182:VAL:HG23	1.97	0.47
4:G:123:THR:N	4:G:124:PRO:HD2	2.30	0.47
6:L:111:LYS:HD2	6:L:199:GLU:HG3	1.97	0.47
3:E:38:TRP:CE2	3:E:44:PRO:HG3	2.50	0.47
5:H:92:CYS:O	5:H:102:GLY:N	2.48	0.47
4:G:385:CYS:HA	4:G:418:CYS:HA	1.97	0.47
5:H:2:VAL:HA	5:H:25:SER:O	2.15	0.47
3:E:61:ARG:NH2	3:E:82:ASP:OD2	2.47	0.47
4:G:317:PHE:CE2	4:G:319:ALA:HB2	2.50	0.47
5:H:84:ALA:HA	5:H:109:VAL:HG23	1.97	0.47
4:G:296:CYS:HA	4:G:331:CYS:HA	1.96	0.46
5:H:66:ARG:HH22	5:H:86:ASP:CG	2.24	0.46
4:G:259:LEU:HB2	4:G:374:HIS:CD2	2.50	0.46
1:B:627:THR:OG1	1:B:630:GLN:HG3	2.15	0.46
4:G:206:PRO:HG3	4:G:318:TYR:CE2	2.50	0.46
6:L:36:TYR:HE1	6:L:46:LEU:HD13	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:384:TYR:CE1	4:G:421:LYS:HB2	2.51	0.46
4:G:86:LEU:HB3	4:G:89:VAL:HG21	1.97	0.46
3:E:24:THR:HB	3:E:70:SER:HB3	1.96	0.46
4:G:257:THR:HG23	4:G:472:GLY:O	2.16	0.46
4:G:335:LYS:HG3	4:G:414:ILE:CG1	2.46	0.46
4:G:427:TRP:CE3	4:G:475:MET:HE2	2.50	0.46
5:H:182:VAL:HG11	5:H:192:TYR:CE2	2.50	0.46
3:E:27(C):CYS:HA	3:E:28:CYS:HA	1.67	0.46
5:H:37:ILE:HD13	5:H:101:TRP:CZ3	2.50	0.46
6:L:25:ARG:NH1	6:L:88:CYS:O	2.49	0.45
6:L:193:SER:HA	6:L:206:THR:HA	1.98	0.45
3:E:8:ALA:O	3:E:102:THR:HA	2.15	0.45
4:G:95:MET:SD	4:G:235:GLY:HA2	2.56	0.45
4:G:155:LYS:HE3	4:G:178:LYS:HG2	1.99	0.45
6:L:37:GLN:HB2	6:L:47:LEU:HD11	1.98	0.45
4:G:135:ASN:HD22	4:G:326:ILE:HG21	1.80	0.45
4:G:280:ASN:HA	4:G:456:ARG:CD	2.46	0.45
5:H:47:TRP:O	5:H:60:ASN:HB2	2.16	0.45
6:L:35:TRP:CE2	6:L:73:LEU:HB2	2.52	0.45
4:G:292:VAL:HG13	4:G:449:ILE:CG1	2.47	0.45
4:G:387:THR:HG22	4:G:416:LEU:HD13	1.98	0.45
4:G:280:ASN:HA	4:G:456:ARG:HD3	1.98	0.45
5:H:163:THR:HG23	5:H:176:LEU:HD21	1.98	0.45
4:G:391:PHE:CE1	4:G:470:PRO:HG2	2.51	0.45
5:H:141:LYS:HG2	5:H:142:ASP:OD1	2.17	0.45
2:D:66:ARG:O	2:D:82:ILE:HA	2.17	0.45
6:L:182:THR:OG1	6:L:183:PRO:HD2	2.17	0.45
6:L:52:GLN:HE21	6:L:52:GLN:HB2	1.55	0.45
6:L:124:GLU:OE1	6:L:124:GLU:N	2.49	0.45
1:B:610:TRP:CG	4:G:498:PRO:HB3	2.51	0.44
4:G:71:THR:HG21	4:G:213:ILE:HB	1.99	0.44
4:G:96:TRP:CE3	4:G:480:ARG:HD3	2.52	0.44
5:H:100(M):TYR:HD2	6:L:34:GLN:HE22	1.63	0.44
5:H:87:SER:OG	5:H:109:VAL:HG22	2.16	0.44
2:D:22:CYS:O	2:D:77:ALA:HA	2.18	0.44
4:G:37:THR:HG21	4:G:501:CYS:HB3	1.98	0.44
4:G:69:TRP:CZ3	4:G:212:PRO:HA	2.52	0.44
6:L:34:GLN:HA	6:L:48:ILE:O	2.18	0.44
1:B:610:TRP:CD2	4:G:498:PRO:HB3	2.52	0.44
4:G:96:TRP:CD2	4:G:275:GLU:HG3	2.53	0.44
4:G:299:PRO:HG2	4:G:327:ARG:HB2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:L:168:GLN:OE1	6:L:174:ALA:HB2	2.18	0.44
1:B:569:THR:HG22	1:B:572:GLY:H	1.81	0.44
5:H:100:ARG:NH1	6:L:31:ARG:O	2.50	0.44
5:H:198:HIS:HD2	5:H:201:SER:HB3	1.83	0.44
6:L:36:TYR:HD1	6:L:46:LEU:HA	1.82	0.44
1:B:618:THR:HG22	1:B:620:ASN:H	1.83	0.44
2:D:6:GLN:HE22	2:D:91:PHE:HA	1.83	0.44
4:G:260:LEU:HD21	4:G:453:LEU:HD21	1.99	0.44
5:H:144:PHE:HA	5:H:145:PRO:HA	1.82	0.44
1:B:648:VAL:HA	1:B:651:ILE:HG22	2.00	0.43
4:G:382:PHE:CD2	4:G:424:ILE:HG13	2.53	0.43
3:E:78:LEU:HD13	3:E:106:VAL:HG23	2.00	0.43
4:G:124:PRO:HG2	4:G:309:ILE:HD12	1.99	0.43
5:H:48:ILE:HG21	5:H:80:LEU:HD11	2.00	0.43
1:B:578:ALA:HB1	4:G:220:PRO:HG3	1.99	0.43
2:D:35:ASN:OD1	2:D:50:TRP:HB3	2.19	0.43
4:G:79:PRO:O	4:G:81:PRO:HD3	2.19	0.43
5:H:152:TRP:CH2	5:H:194:CYS:HB3	2.53	0.43
5:H:148:VAL:HG22	5:H:176:LEU:HD13	2.00	0.43
6:L:32:ALA:HA	6:L:51:ASN:ND2	2.33	0.43
6:L:59:PRO:HB2	6:L:61:ARG:HG2	2.00	0.43
2:D:28:ARG:HG2	2:D:72(H):PHE:O	2.19	0.43
2:D:47:TRP:HZ2	2:D:50:TRP:CD1	2.36	0.43
3:E:34:SER:HA	3:E:48:ILE:O	2.19	0.43
5:H:82:LEU:HD22	5:H:82(C):VAL:HG12	2.00	0.43
5:H:124:PRO:HB3	5:H:135:ALA:O	2.19	0.43
4:G:35:TRP:HB2	4:G:501:CYS:O	2.19	0.43
4:G:205:CYS:C	4:G:207:LYS:H	2.27	0.43
4:G:261:LEU:HD13	8:F:1:NAG:H82	2.01	0.43
2:D:87:THR:OG1	2:D:110:THR:HG23	2.19	0.42
5:H:82:LEU:HD23	5:H:82(A):ASN:H	1.83	0.42
4:G:346:VAL:HG13	4:G:359:ILE:HD12	2.00	0.42
5:H:47:TRP:HB2	6:L:98:PHE:CE1	2.53	0.42
3:E:33:ILE:HA	3:E:89:CYS:O	2.20	0.42
4:G:291:ALA:CB	4:G:448:ASN:HB3	2.48	0.42
5:H:61:PRO:HA	5:H:64:LYS:HB2	2.00	0.42
5:H:161:VAL:HA	5:H:180:VAL:HG22	2.02	0.42
3:E:23:CYS:HB2	3:E:35:TRP:CH2	2.54	0.42
4:G:69:TRP:CE3	4:G:253:PRO:HG2	2.55	0.42
6:L:182:THR:HG22	6:L:185:GLN:HB2	2.02	0.42
2:D:19:LYS:HD2	2:D:81:GLU:HG3	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:31:PHE:HA	7:A:1:NAG:H62	2.00	0.42
2:D:38:ARG:HB3	2:D:90:TYR:CD2	2.55	0.42
4:G:330:HIS:NE2	9:I:1:NAG:H82	2.35	0.42
7:A:4:MAN:H3	7:A:5:MAN:H3	2.01	0.42
4:G:276:ASN:OD1	4:G:278:THR:OG1	2.38	0.42
6:L:163:THR:HG22	6:L:164:THR:O	2.19	0.42
1:B:530:MET:HG2	1:B:628:TRP:CD1	2.54	0.42
4:G:101:VAL:HG12	4:G:483:LEU:HB2	2.01	0.42
5:H:121:PRO:HG3	5:H:207:LYS:HG3	2.02	0.42
4:G:434:MET:HG2	4:G:435:TYR:N	2.35	0.41
1:B:519:ILE:HG13	1:B:536:ALA:CB	2.50	0.41
2:D:31:PHE:HB3	2:D:98:ARG:HD2	2.02	0.41
4:G:215:ILE:N	4:G:251:ILE:O	2.36	0.41
2:D:19:LYS:HE3	2:D:79:TYR:HB3	2.01	0.41
4:G:42:VAL:HG22	4:G:493:PRO:O	2.19	0.41
4:G:104:MET:SD	4:G:479:TRP:HB3	2.60	0.41
4:G:499:THR:O	4:G:501:CYS:N	2.53	0.41
5:H:165:PRO:HG2	6:L:163:THR:HG21	2.02	0.41
5:H:13:LYS:HE2	5:H:13:LYS:HB3	1.89	0.41
2:D:82(C):LEU:HD11	2:D:110:THR:HG21	2.03	0.41
3:E:19:VAL:CG2	3:E:78:LEU:HD11	2.50	0.41
2:D:37:ILE:HG13	2:D:103:TRP:CH2	2.56	0.41
3:E:79:ARG:HB3	3:E:80:PRO:HD2	2.03	0.41
4:G:288:LEU:HD21	4:G:345:ILE:HD11	2.03	0.41
4:G:87:GLY:O	4:G:89:VAL:HG23	2.21	0.41
6:L:36:TYR:CE1	6:L:46:LEU:HD13	2.55	0.41
4:G:33:LYS:HB2	4:G:35:TRP:CH2	2.56	0.41
5:H:122:LEU:HB3	6:L:119:PHE:CD2	2.56	0.41
6:L:149:TRP:CD1	6:L:160:VAL:HG21	2.56	0.41
3:E:103:LYS:H	3:E:103:LYS:HD2	1.85	0.40
4:G:192:ARG:NH2	4:G:197:ASN:OD1	2.54	0.40
4:G:229:ASN:HB2	4:G:241:ASN:CG	2.46	0.40
4:G:253:PRO:HA	4:G:479:TRP:HZ3	1.86	0.40
4:G:411:GLU:C	10:G:631:NAG:H82	2.46	0.40
3:E:54:ARG:CZ	3:E:60:PRO:HA	2.52	0.40
6:L:129:ASN:O	6:L:130:LYS:HG3	2.21	0.40
1:B:522:PHE:O	4:G:84:ILE:HG21	2.21	0.40
1:B:627:THR:HG23	1:B:630:GLN:OE1	2.22	0.40
4:G:387:THR:HB	4:G:391:PHE:HE1	1.84	0.40
6:L:187:LYS:HD2	6:L:187:LYS:HA	1.93	0.40
4:G:158:SER:HA	4:G:172:GLU:O	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:L:119:PHE:HB2	6:L:134:VAL:HG23	2.03	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	B	119/153 (78%)	106 (89%)	12 (10%)	1 (1%)	16	37
2	D	126/134 (94%)	105 (83%)	18 (14%)	3 (2%)	4	13
3	E	110/114 (96%)	87 (79%)	22 (20%)	1 (1%)	14	34
4	G	410/489 (84%)	351 (86%)	50 (12%)	9 (2%)	5	15
5	H	223/244 (91%)	200 (90%)	20 (9%)	3 (1%)	9	26
6	L	209/217 (96%)	184 (88%)	22 (10%)	3 (1%)	9	24
All	All	1197/1351 (89%)	1033 (86%)	144 (12%)	20 (2%)	7	20

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	G	65	VAL
4	G	70	ALA
4	G	354	PRO
6	L	101	ALA
4	G	235	GLY
4	G	412	GLN
4	G	429	GLY
4	G	500	ALA
6	L	51	ASN
5	H	68	ILE
4	G	374	HIS

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Mol	Chain	Res	Type
5	H	117	PRO
2	D	82(B)	ASN
2	D	72	ASP
2	D	100(F)	PRO
3	E	77	ASP
6	L	95(A)	GLY
4	G	430	VAL
5	H	48	ILE
1	B	519	ILE

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	B	107/130 (82%)	103 (96%)	4 (4%)	30	55
2	D	107/112 (96%)	103 (96%)	4 (4%)	30	55
3	E	98/100 (98%)	95 (97%)	3 (3%)	35	59
4	G	375/433 (87%)	359 (96%)	16 (4%)	26	52
5	H	197/212 (93%)	192 (98%)	5 (2%)	42	66
6	L	175/181 (97%)	171 (98%)	4 (2%)	44	67
All	All	1059/1168 (91%)	1023 (97%)	36 (3%)	32	58

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	540	GLN
1	B	570	VAL
1	B	571	TRP
1	B	632	GLU
2	D	38	ARG
2	D	80	MET
2	D	91	PHE
2	D	94	LYS
3	E	31	LYS

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Mol	Chain	Res	Type
3	E	89	CYS
3	E	96	CYS
4	G	34	LYS
4	G	54	CYS
4	G	101	VAL
4	G	154	MET
4	G	207	LYS
4	G	234	ASN
4	G	292	VAL
4	G	293	GLU
4	G	374	HIS
4	G	416	LEU
4	G	426	MET
4	G	448	ASN
4	G	456	ARG
4	G	467	THR
4	G	475	MET
4	G	490	LYS
5	H	20	LEU
5	H	50	TYR
5	H	62	SER
5	H	63	LEU
5	H	67	VAL
6	L	25	ARG
6	L	49	TYR
6	L	52	GLN
6	L	54	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	591	GLN
2	D	39	GLN
4	G	103	GLN
4	G	374	HIS
5	H	5	GLN
5	H	197	ASN
6	L	38	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

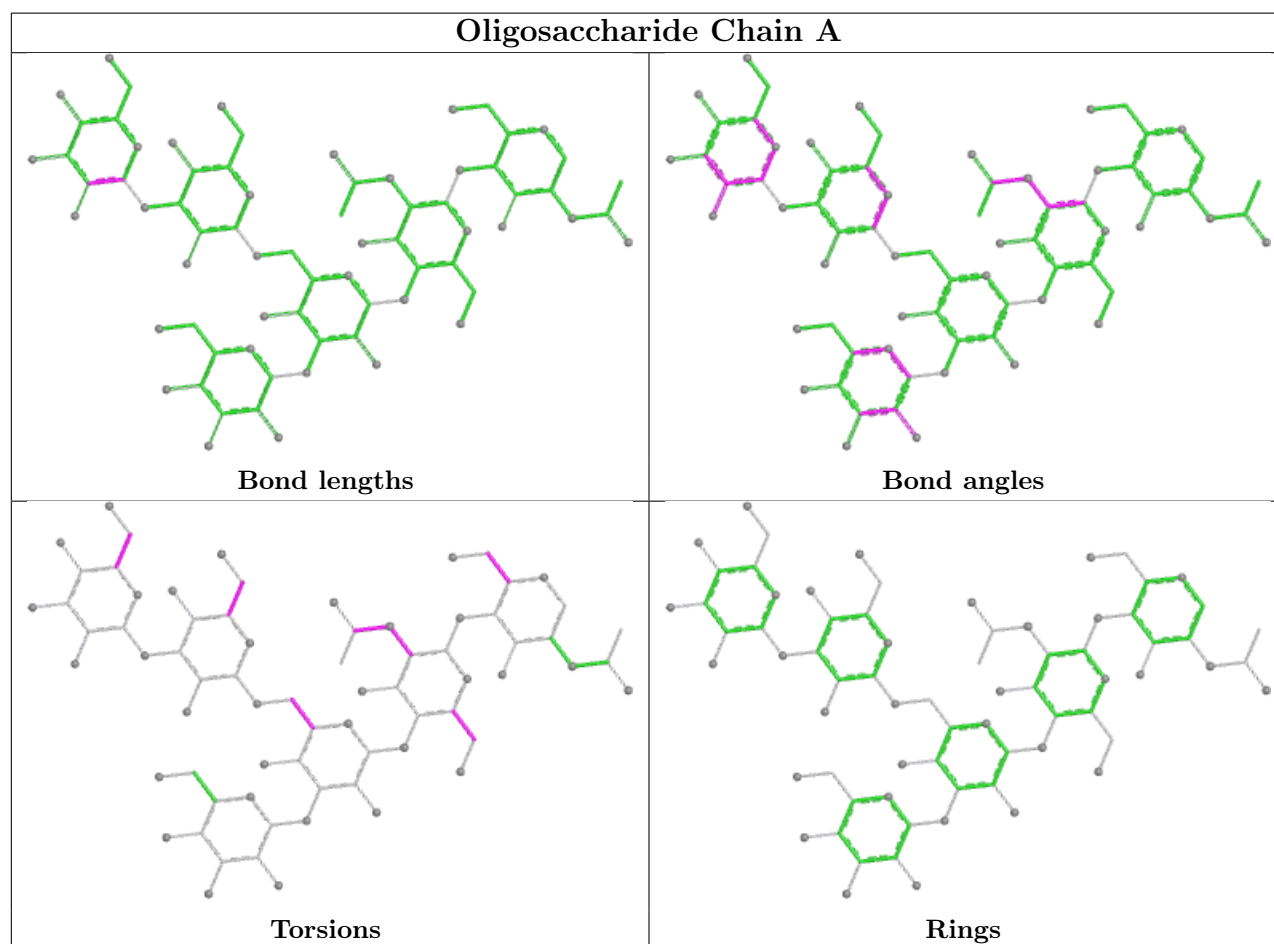
5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

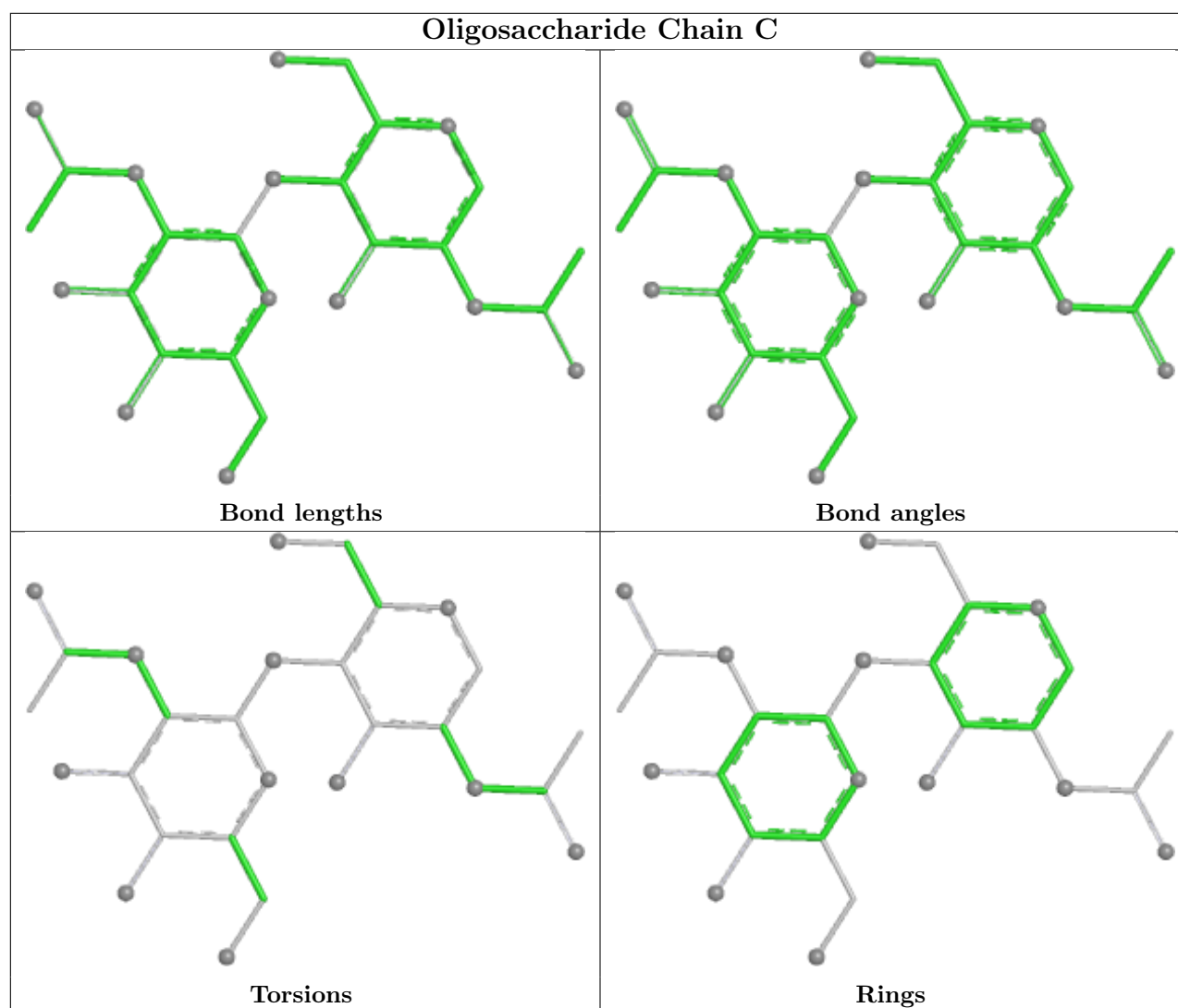
Mogul was not executed - this section is therefore empty.

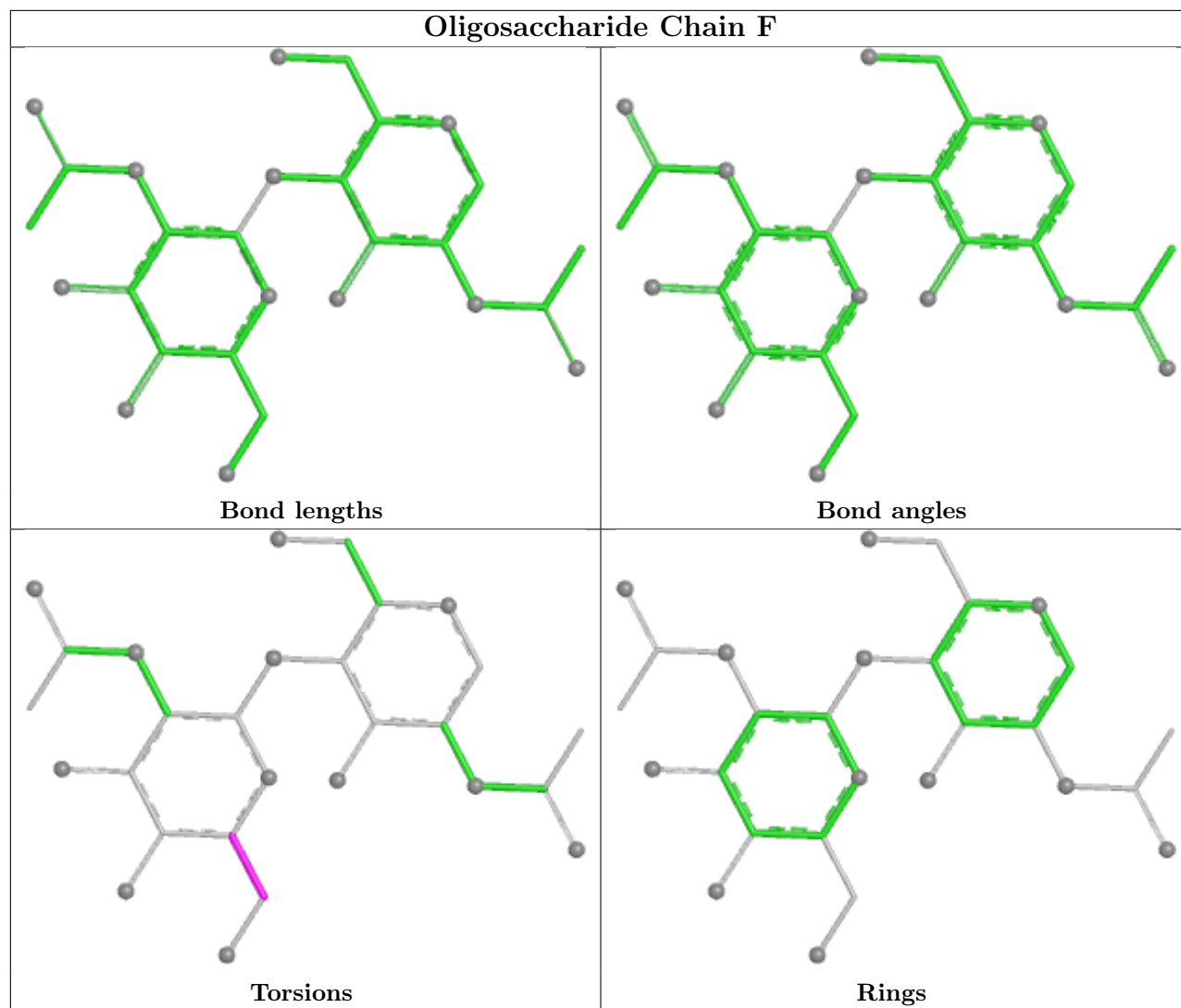
5.5 Carbohydrates [i](#)

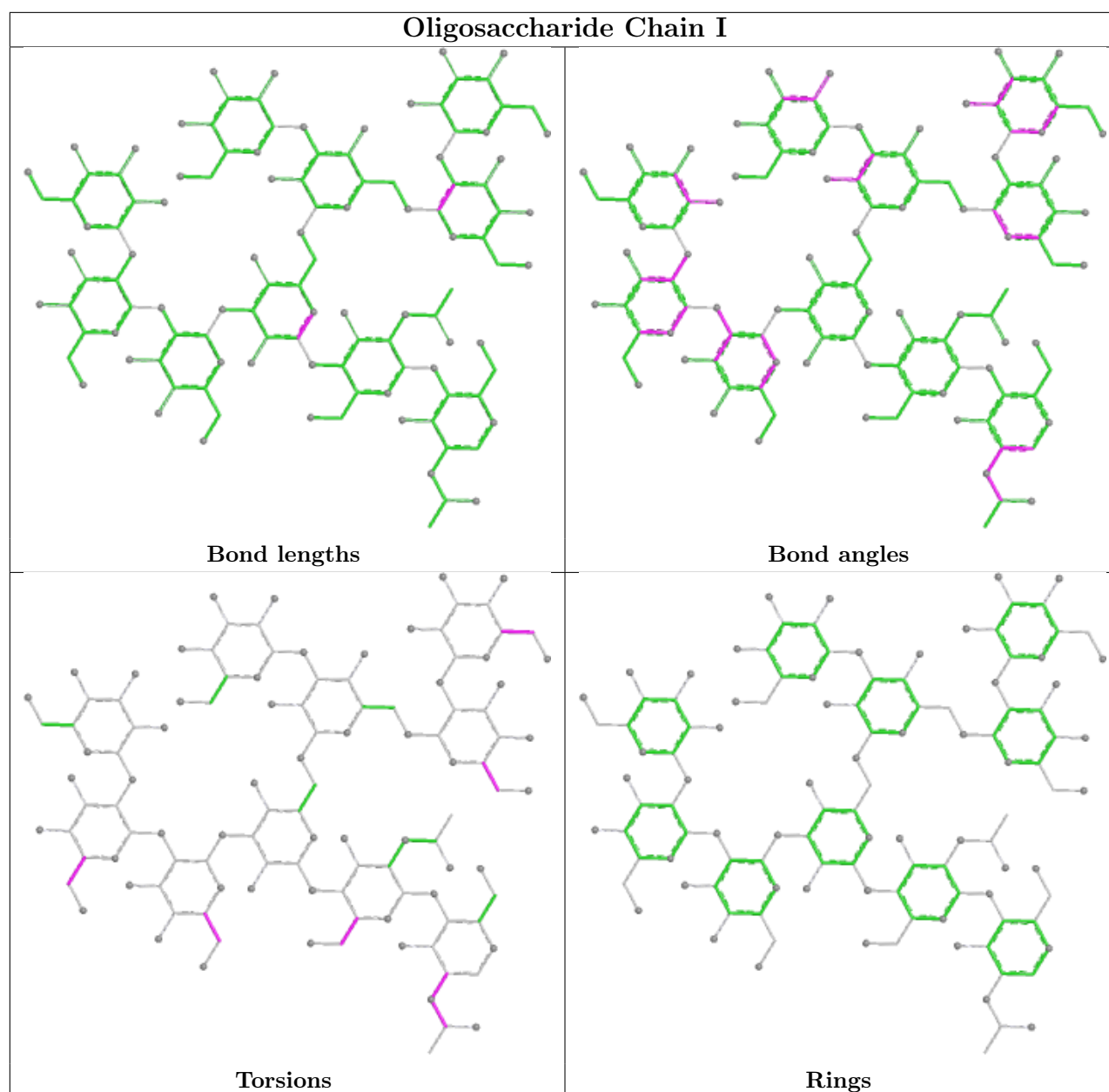
Mogul was not executed - this section is therefore empty.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.









5.6 Ligand geometry [i](#)

Mogul was not executed - this section is therefore empty.

5.7 Other polymers [i](#)

Mogul was not executed - this section is therefore empty.

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](#)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

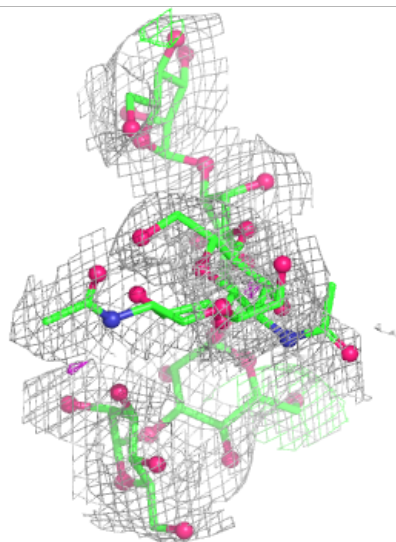
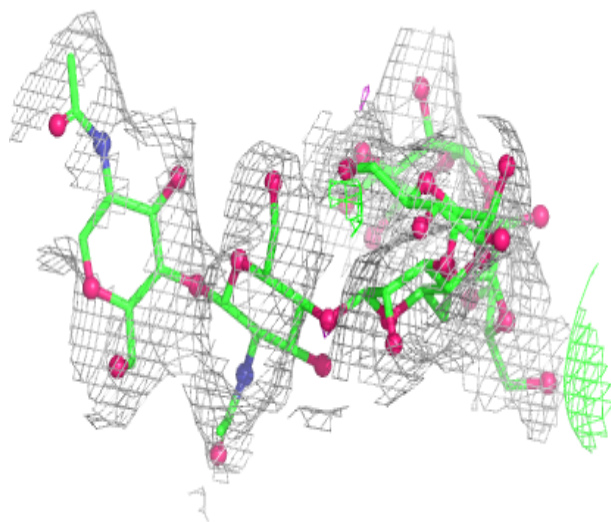
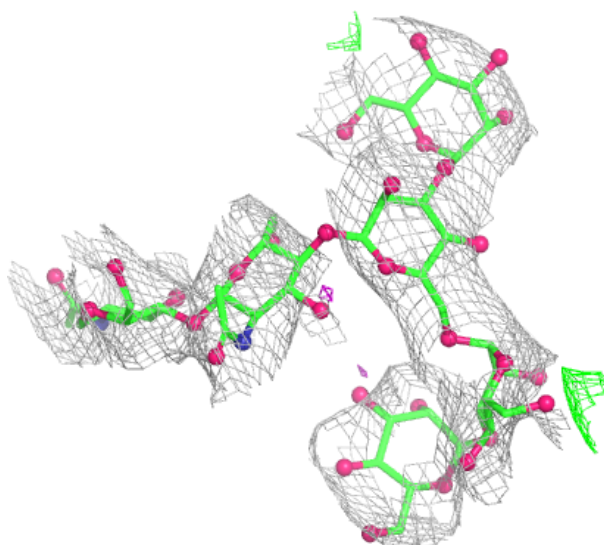
6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

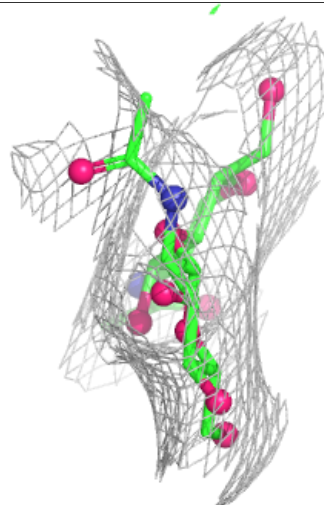
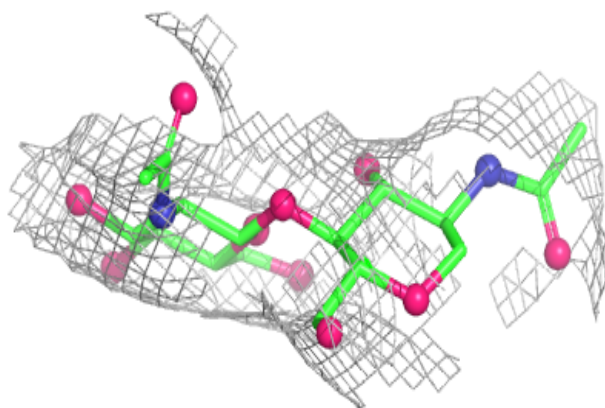
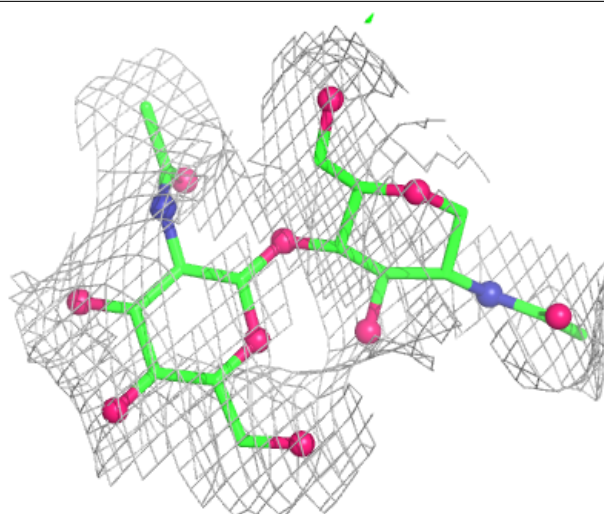
Electron density around Chain A:

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



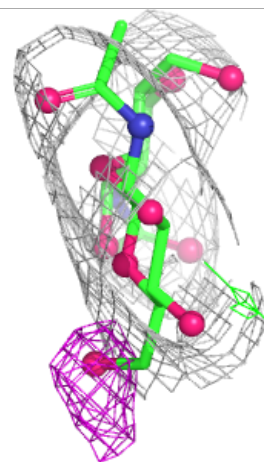
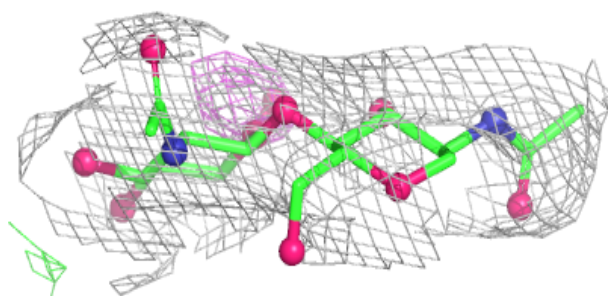
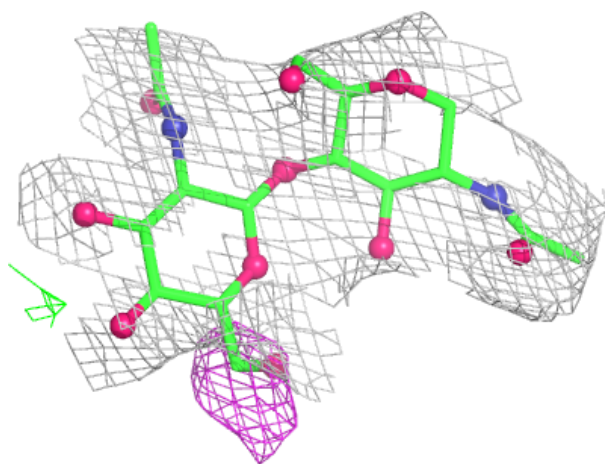
Electron density around Chain C:

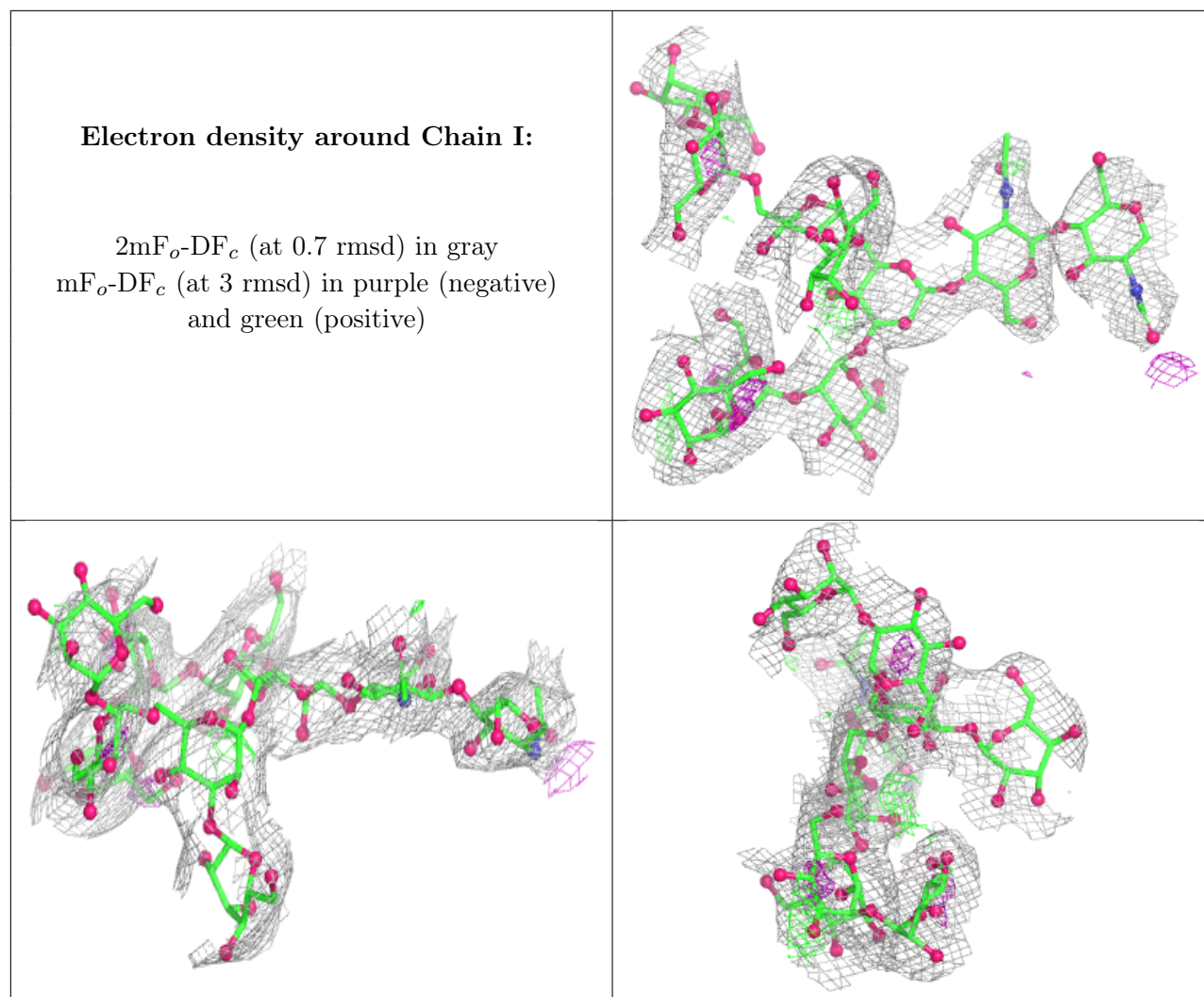
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain F:

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





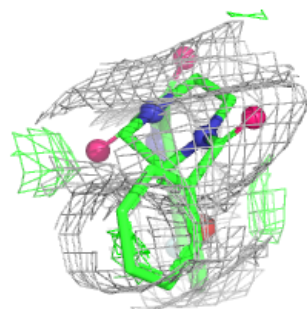
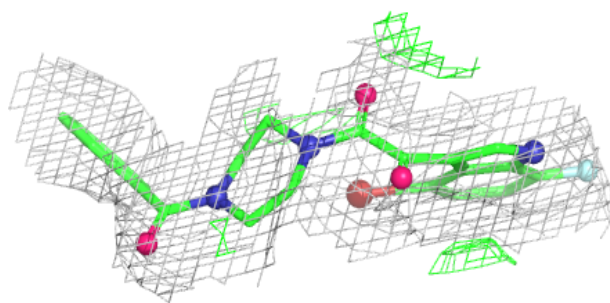
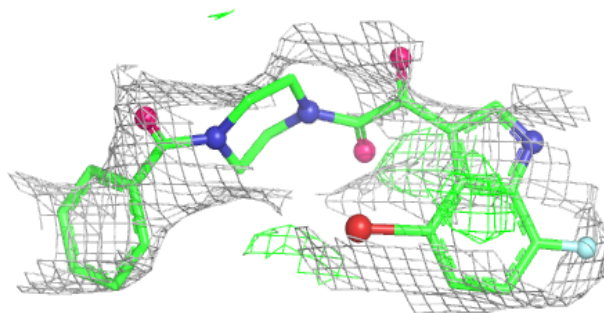
6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

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 JYS G 633:

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



6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.