



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:00 AM UTC

PDB ID : 3CCC / pdb_00003ccc
Title : Crystal Structure of Human DPP4 in complex with a benzimidazole derivative
Authors : Wallace, M.B.; Skene, R.J.
Deposited on : 2008-02-25
Resolution : 2.71 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

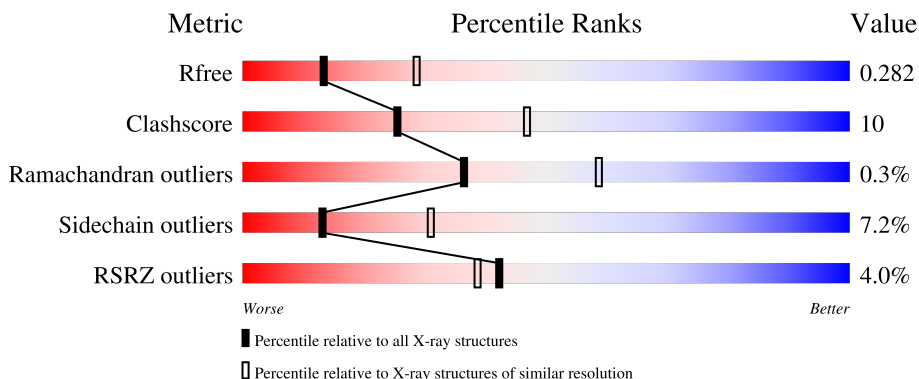
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.71 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.



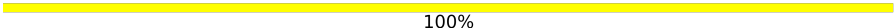

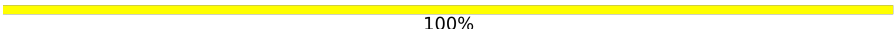
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	4348 (2.74-2.70)
Clashscore	190562	4665 (2.74-2.70)
Ramachandran outliers	187476	4584 (2.74-2.70)
Sidechain outliers	187428	4585 (2.74-2.70)
RSRZ outliers	180081	4348 (2.74-2.70)

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	740	
1	B	740	
1	C	740	
1	D	740	
2	E	2	

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Mol	Chain	Length	Quality of chain
2	F	2	 100%
2	G	2	 50% 50%
2	H	2	 100%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	NAG	C	804	X	-	-	-

2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 24357 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 Dipeptidyl peptidase 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	724	5929	3809	974	1120	26	0	0	0
1	B	724	5929	3809	974	1120	26	0	0	0
1	C	724	5929	3809	974	1120	26	0	0	0
1	D	724	5929	3809	974	1120	26	0	0	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	27	ALA	-	expression tag	UNP P27487
A	28	ASP	-	expression tag	UNP P27487
A	29	PRO	-	expression tag	UNP P27487
A	30	GLY	-	expression tag	UNP P27487
A	31	GLY	-	expression tag	UNP P27487
A	32	SER	-	expression tag	UNP P27487
A	33	HIS	-	expression tag	UNP P27487
A	34	HIS	-	expression tag	UNP P27487
A	35	HIS	-	expression tag	UNP P27487
A	36	HIS	-	expression tag	UNP P27487
A	37	HIS	-	expression tag	UNP P27487
A	38	HIS	-	expression tag	UNP P27487
B	27	ALA	-	expression tag	UNP P27487
B	28	ASP	-	expression tag	UNP P27487
B	29	PRO	-	expression tag	UNP P27487
B	30	GLY	-	expression tag	UNP P27487
B	31	GLY	-	expression tag	UNP P27487
B	32	SER	-	expression tag	UNP P27487
B	33	HIS	-	expression tag	UNP P27487
B	34	HIS	-	expression tag	UNP P27487
B	35	HIS	-	expression tag	UNP P27487

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Chain	Residue	Modelled	Actual	Comment	Reference
B	36	HIS	-	expression tag	UNP P27487
B	37	HIS	-	expression tag	UNP P27487
B	38	HIS	-	expression tag	UNP P27487
C	27	ALA	-	expression tag	UNP P27487
C	28	ASP	-	expression tag	UNP P27487
C	29	PRO	-	expression tag	UNP P27487
C	30	GLY	-	expression tag	UNP P27487
C	31	GLY	-	expression tag	UNP P27487
C	32	SER	-	expression tag	UNP P27487
C	33	HIS	-	expression tag	UNP P27487
C	34	HIS	-	expression tag	UNP P27487
C	35	HIS	-	expression tag	UNP P27487
C	36	HIS	-	expression tag	UNP P27487
C	37	HIS	-	expression tag	UNP P27487
C	38	HIS	-	expression tag	UNP P27487
D	27	ALA	-	expression tag	UNP P27487
D	28	ASP	-	expression tag	UNP P27487
D	29	PRO	-	expression tag	UNP P27487
D	30	GLY	-	expression tag	UNP P27487
D	31	GLY	-	expression tag	UNP P27487
D	32	SER	-	expression tag	UNP P27487
D	33	HIS	-	expression tag	UNP P27487
D	34	HIS	-	expression tag	UNP P27487
D	35	HIS	-	expression tag	UNP P27487
D	36	HIS	-	expression tag	UNP P27487
D	37	HIS	-	expression tag	UNP P27487
D	38	HIS	-	expression tag	UNP P27487

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



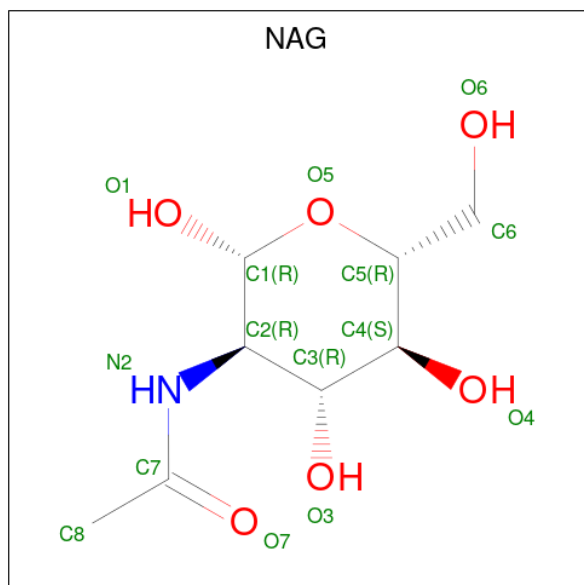
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	F	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	G	2	Total	C	N	O	0	0	0
			28	16	2	10			

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

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



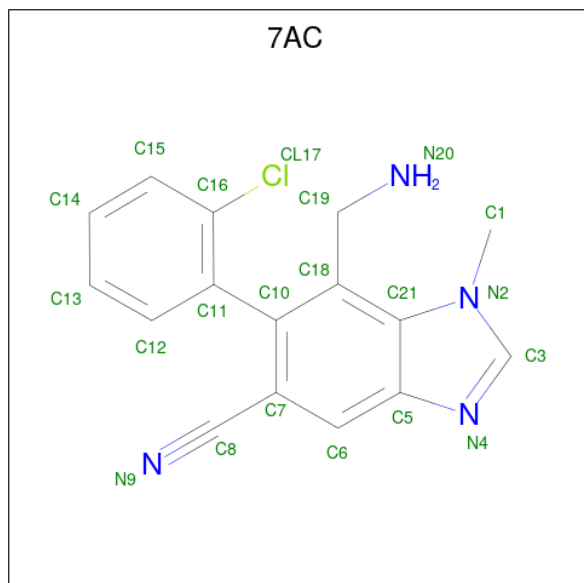
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	14	8	1	5	0	0
3	A	1	14	8	1	5	0	0
3	A	1	14	8	1	5	0	0
3	A	1	14	8	1	5	0	0
3	B	1	14	8	1	5	0	0
3	B	1	14	8	1	5	0	0
3	B	1	14	8	1	5	0	0
3	C	1	14	8	1	5	0	0
3	C	1	14	8	1	5	0	0
3	C	1	14	8	1	5	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	D	1	Total	C	N	O	0	0
			14	8	1	5		
3	D	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 4 is 7-(aminomethyl)-6-(2-chlorophenyl)-1-methyl-1H-benzimidazole-5-carbonitrile (CCD ID: 7AC) (formula: C₁₆H₁₃ClN₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	Cl	N	0	0
			21	16	1	4		
4	B	1	Total	C	Cl	N	0	0
			21	16	1	4		
4	C	1	Total	C	Cl	N	0	0
			21	16	1	4		
4	D	1	Total	C	Cl	N	0	0
			21	16	1	4		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	85	Total	O	0	0
			85	85		
5	B	106	Total	O	0	0
			106	106		
5	C	56	Total	O	0	0
			56	56		

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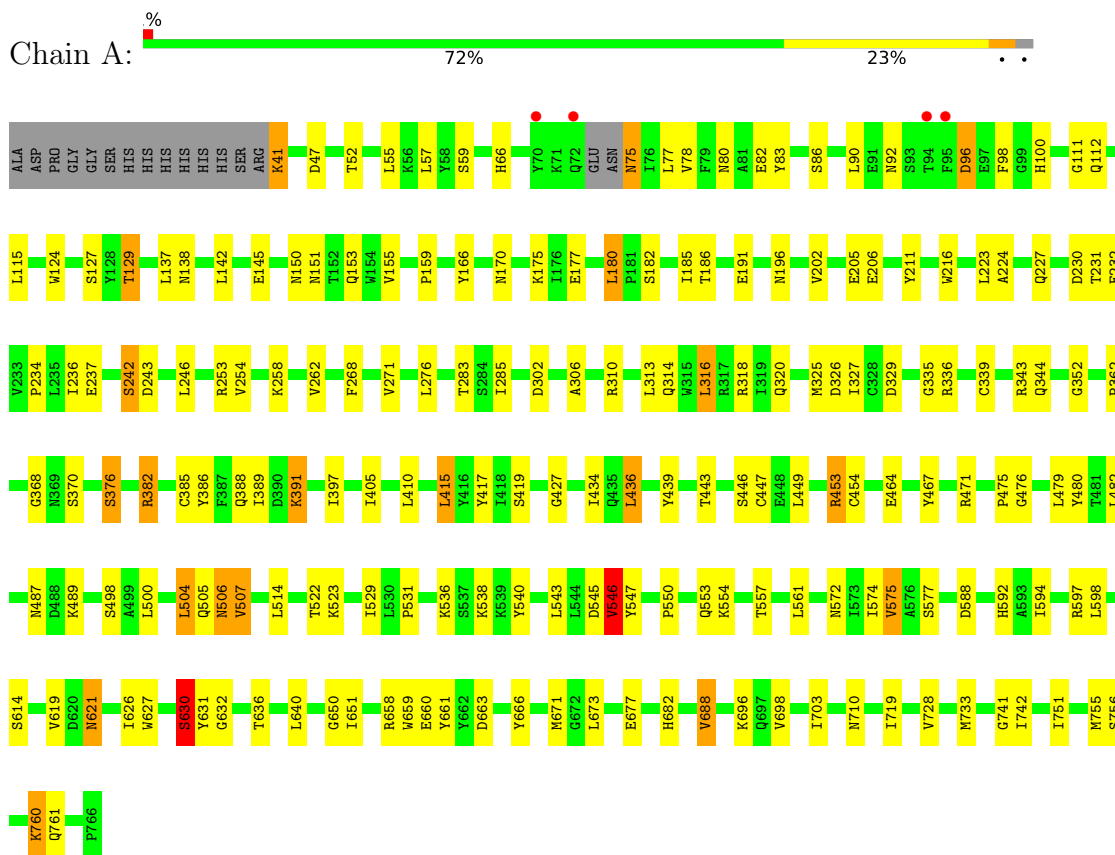
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	30	Total	O	0	0
			30	30		

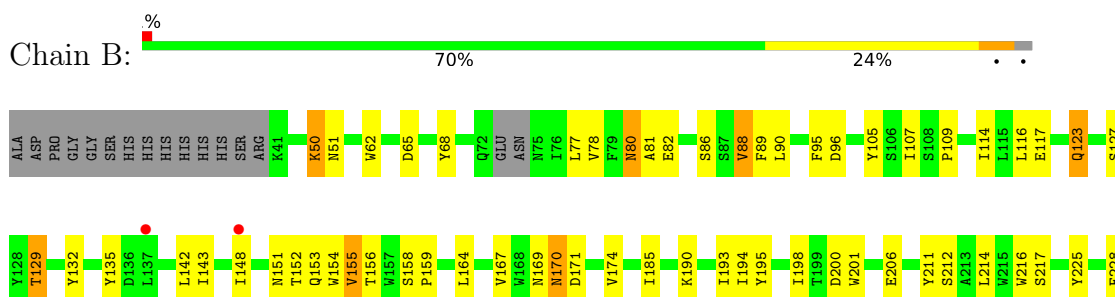
3 Residue-property plots [i](#)

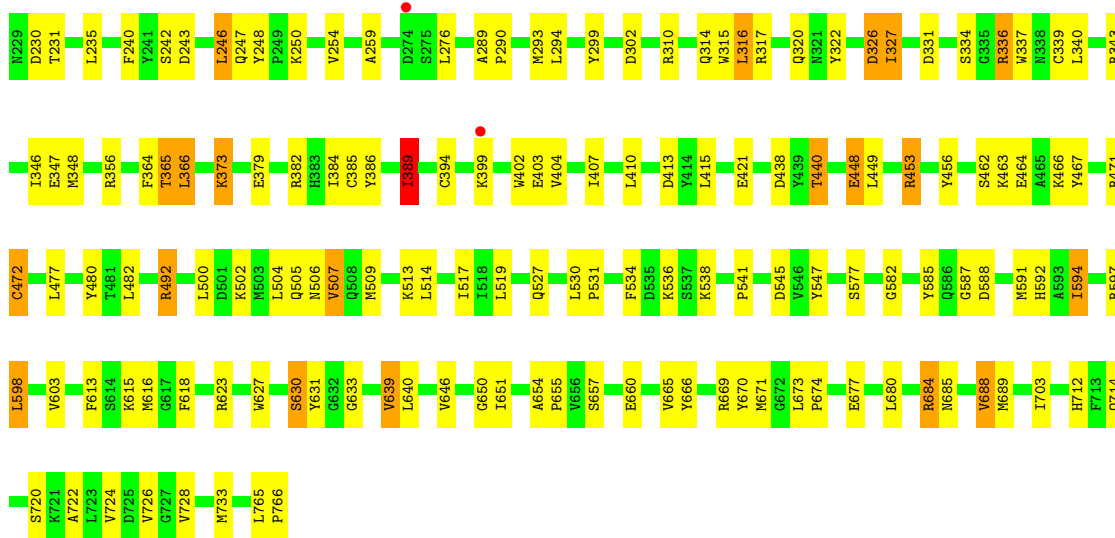
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Dipeptidyl peptidase 4

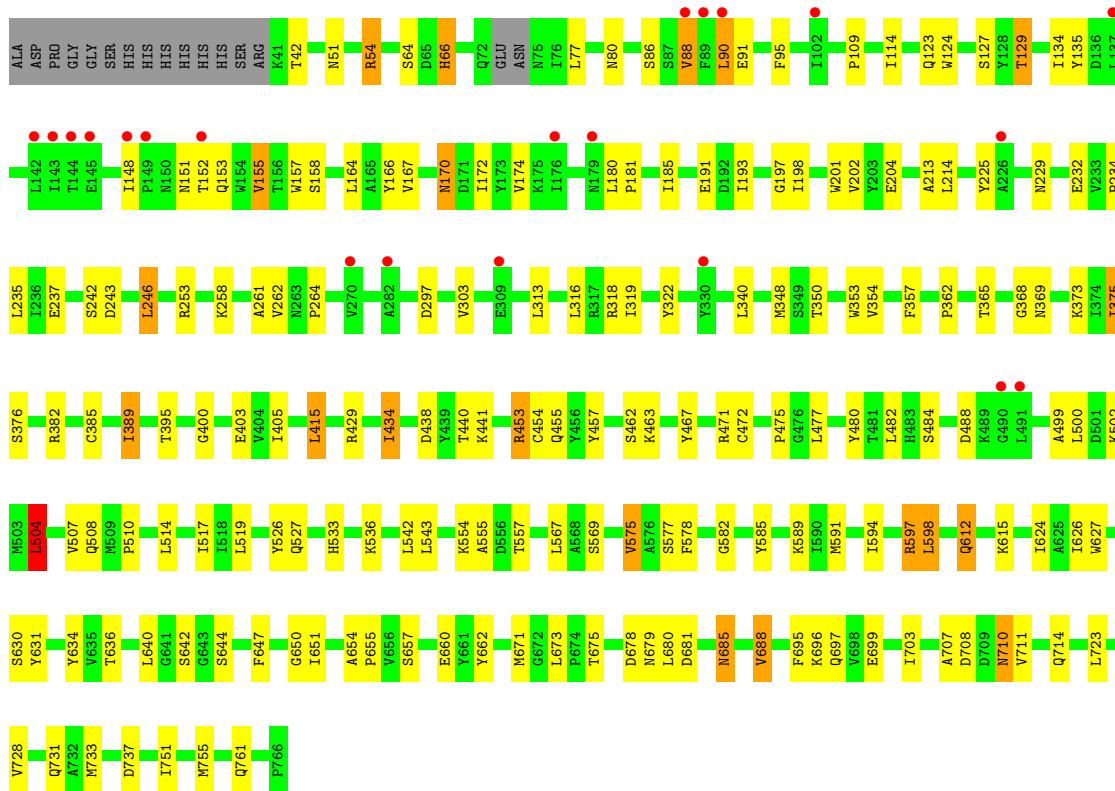
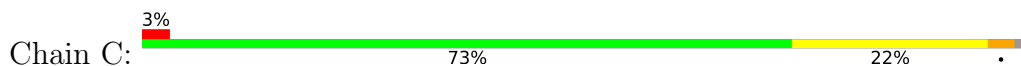


- Molecule 1: Dipeptidyl peptidase 4

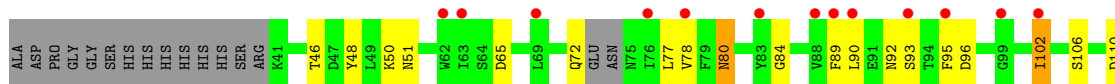


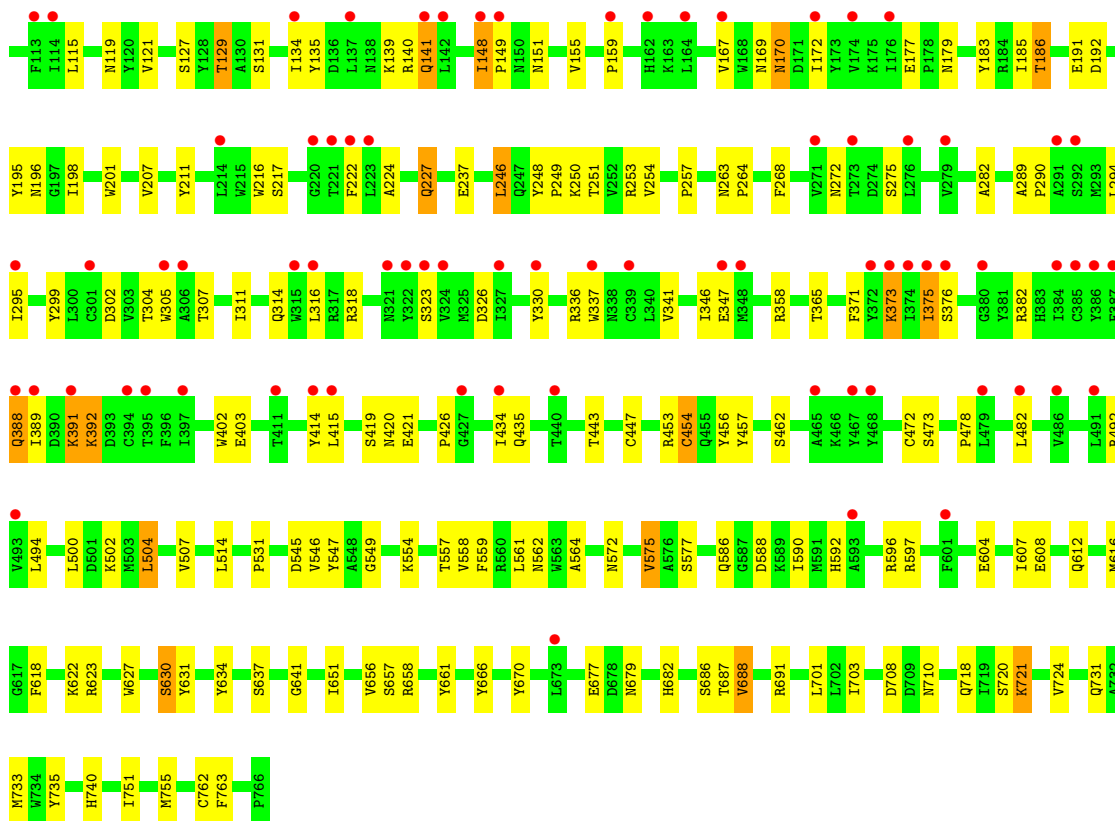


• Molecule 1: Dipeptidyl peptidase 4



• Molecule 1: Dipeptidyl peptidase 4






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

Chain E:  100%



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

Chain F:  100%



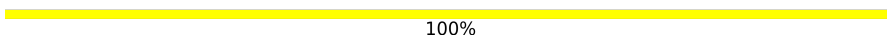
- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  50% 50%



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

Chain H:



100%

MAG1
MAG2

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	121.90Å 121.96Å 144.28Å 90.00° 114.94° 90.00°	Depositor
Resolution (Å)	46.13 – 2.71 46.13 – 2.71	Depositor EDS
% Data completeness (in resolution range)	90.9 (46.13-2.71) 91.0 (46.13-2.71)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.58 (at 2.73Å)	Xtrriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.200 , 0.267 0.223 , 0.282	Depositor DCC
R_{free} test set	4722 reflections (4.54%)	wwPDB-VP
Wilson B-factor (Å ²)	57.3	Xtrriage
Anisotropy	0.180	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 27.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.023 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	24357	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.11% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, 7AC

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	0.55	0/6100	0.86	4/8296 (0.0%)
1	B	0.58	0/6100	0.87	3/8296 (0.0%)
1	C	0.55	0/6100	0.85	3/8296 (0.0%)
1	D	0.52	0/6100	0.84	3/8296 (0.0%)
All	All	0.55	0/24400	0.85	13/33184 (0.0%)

There are no bond length outliers.

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	140	ARG	N-CA-C	7.39	119.56	110.91
1	A	546	VAL	N-CA-C	6.68	119.14	108.85
1	C	357	PHE	N-CA-C	-6.66	107.03	114.62
1	D	546	VAL	N-CA-C	6.11	116.92	108.12
1	A	96	ASP	N-CA-C	-5.92	106.60	113.88
1	B	646	VAL	N-CA-C	5.63	116.41	110.72
1	B	633	GLY	N-CA-C	-5.63	105.97	112.50
1	B	96	ASP	N-CA-C	-5.54	105.34	111.71
1	D	454	CYS	N-CA-C	5.45	119.07	107.67
1	A	335	GLY	N-CA-C	-5.29	107.50	115.32
1	C	504	LEU	N-CA-C	5.26	117.92	111.82
1	A	630	SER	CB-CA-C	-5.15	110.23	117.23
1	C	400	GLY	N-CA-C	5.01	117.16	111.85

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5929	0	5649	113	0
1	B	5929	0	5649	124	0
1	C	5929	0	5649	104	0
1	D	5929	0	5651	117	0
2	E	28	0	25	0	0
2	F	28	0	25	0	0
2	G	28	0	25	0	0
2	H	28	0	25	0	0
3	A	56	0	52	0	0
3	B	42	0	39	0	0
3	C	42	0	39	0	0
3	D	28	0	26	0	0
4	A	21	0	13	4	0
4	B	21	0	13	3	0
4	C	21	0	13	1	0
4	D	21	0	13	2	0
5	A	85	0	0	1	0
5	B	106	0	0	0	0
5	C	56	0	0	0	0
5	D	30	0	0	0	0
All	All	24357	0	22906	450	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 10.

All (450) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:651:ILE:HD13	1:A:755:MET:HG2	1.40	1.01
1:C:253:ARG:HH21	1:D:253:ARG:HH21	1.05	0.99
1:D:658:ARG:HB2	1:D:687:THR:HG22	1.50	0.93
1:B:640:LEU:HD11	1:B:650:GLY:HA3	1.54	0.90
1:C:235:LEU:HD23	1:C:253:ARG:HB3	1.54	0.86
1:B:78:VAL:HG23	1:B:89:PHE:HB2	1.59	0.82
1:D:720:SER:O	1:D:724:VAL:HG23	1.77	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:253:ARG:HH21	1:D:253:ARG:NH2	1.78	0.81
1:A:153:GLN:HE22	1:A:170:ASN:H	1.27	0.80
1:D:414:TYR:HE2	1:D:435:GLN:HG2	1.45	0.79
1:C:253:ARG:NH2	1:D:253:ARG:HH21	1.83	0.77
1:A:388:GLN:HB2	1:A:391:LYS:HG2	1.68	0.76
1:A:550:PRO:HG3	1:A:594:ILE:HD11	1.69	0.74
1:D:751:ILE:HG12	1:D:755:MET:HE2	1.70	0.74
1:D:623:ARG:HH11	1:D:763:PHE:HB3	1.55	0.71
1:D:139:LYS:HG3	1:D:141:GLN:HE22	1.56	0.71
1:A:55:LEU:HD23	1:A:500:LEU:HD22	1.71	0.71
1:A:82:GLU:HG2	1:A:467:TYR:OH	1.91	0.71
1:A:696:LYS:HG3	1:A:728:VAL:HG22	1.71	0.70
1:C:237:GLU:HG2	1:C:253:ARG:HG2	1.73	0.70
1:D:388:GLN:H	1:D:391:LYS:HE2	1.57	0.69
1:B:336:ARG:HH11	1:B:336:ARG:HB2	1.57	0.69
1:B:630:SER:HB2	4:B:800:7AC:N9	2.08	0.68
1:A:471:ARG:HG3	1:A:480:TYR:CE1	2.28	0.68
1:A:77:LEU:HD23	1:A:86:SER:OG	1.94	0.67
1:A:504:LEU:HA	1:A:507:VAL:CG1	2.25	0.66
1:D:80:ASN:O	1:D:84:GLY:HA2	1.96	0.66
1:B:386:TYR:O	1:B:394:CYS:HB2	1.96	0.65
1:A:554:LYS:HB3	1:A:577:SER:HB3	1.78	0.65
1:B:720:SER:O	1:B:724:VAL:HG23	1.97	0.65
1:B:78:VAL:CG2	1:B:89:PHE:HB2	2.27	0.65
1:A:329:ASP:OD2	1:A:343:ARG:NH1	2.30	0.65
1:B:114:ILE:HG23	1:B:135:TYR:HB3	1.77	0.64
1:D:588:ASP:HB3	1:D:592:HIS:CD2	2.33	0.64
1:B:507:VAL:HG21	1:B:509:MET:HE2	1.80	0.64
1:D:102:ILE:HD13	1:D:102:ILE:H	1.63	0.64
1:C:66:HIS:HB3	1:C:467:TYR:HE1	1.63	0.63
1:B:153:GLN:HE22	1:B:170:ASN:H	1.44	0.63
1:B:588:ASP:HB3	1:B:592:HIS:HD2	1.64	0.63
1:D:72:GLN:HG3	1:D:77:LEU:HD22	1.80	0.63
1:A:302:ASP:HB3	1:A:314:GLN:HB2	1.79	0.62
1:A:316:LEU:HD13	1:A:320:GLN:HG2	1.82	0.62
1:B:148:ILE:HD11	1:B:164:LEU:HD21	1.80	0.62
4:B:800:7AC:H19A	4:B:800:7AC:H1	1.81	0.62
1:D:402:TRP:CD2	1:D:421:GLU:HB2	2.33	0.62
1:D:473:SER:HB3	1:D:558:VAL:HG13	1.82	0.62
1:C:543:LEU:HD23	1:C:567:LEU:HD13	1.82	0.62
1:B:105:TYR:HB2	1:B:114:ILE:HD11	1.82	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:153:GLN:HE22	1:C:170:ASN:H	1.48	0.61
1:A:614:SER:HA	1:A:619:VAL:HB	1.82	0.61
1:C:152:THR:HG21	1:C:155:VAL:HG22	1.82	0.61
1:D:290:PRO:HG3	1:D:326:ASP:OD1	2.00	0.61
1:A:185:ILE:HG22	1:A:186:THR:HG23	1.81	0.61
1:D:121:VAL:HB	1:D:129:THR:HG22	1.83	0.61
1:C:51:ASN:HD21	1:C:54:ARG:HD2	1.64	0.61
1:C:170:ASN:N	1:C:170:ASN:HD22	1.97	0.61
1:A:175:LYS:HG2	1:A:182:SER:HB3	1.83	0.61
1:C:510:PRO:HD3	1:C:569:SER:HB2	1.83	0.61
1:A:703:ILE:HG21	1:A:751:ILE:HD12	1.82	0.60
1:A:756:SER:O	1:A:760:LYS:HB2	2.00	0.60
1:A:98:PHE:CE1	1:A:100:HIS:HB2	2.36	0.60
1:A:115:LEU:HD21	1:A:155:VAL:HG21	1.82	0.60
1:B:82:GLU:HG2	1:B:467:TYR:OH	2.02	0.60
1:B:726:VAL:HG23	1:B:728:VAL:HG23	1.83	0.60
1:C:155:VAL:HG13	1:C:166:TYR:HB3	1.84	0.60
1:D:346:ILE:H	1:D:392:LYS:NZ	2.00	0.60
1:C:630:SER:HB2	4:C:800:7AC:N9	2.17	0.59
1:A:543:LEU:HD21	1:A:627:TRP:CD1	2.37	0.59
1:B:114:ILE:CG2	1:B:135:TYR:HB3	2.32	0.58
1:D:272:ASN:ND2	1:D:275:SER:HB3	2.17	0.58
1:B:598:LEU:HD22	1:B:671:MET:HG2	1.85	0.58
1:A:388:GLN:HG3	1:A:391:LYS:HE2	1.85	0.58
1:A:155:VAL:HG12	1:A:166:TYR:CB	2.34	0.57
1:A:196:ASN:OD1	1:A:227:GLN:HG3	2.05	0.57
1:D:78:VAL:HG23	1:D:89:PHE:HB2	1.87	0.57
1:B:159:PRO:HG3	1:B:217:SER:O	2.05	0.57
1:A:242:SER:OG	1:A:243:ASP:N	2.38	0.56
1:B:302:ASP:HB3	1:B:314:GLN:HB2	1.87	0.56
1:A:531:PRO:HB3	1:A:572:ASN:HD22	1.71	0.56
1:C:124:TRP:HB2	1:C:204:GLU:OE1	2.05	0.56
1:D:630:SER:HB2	4:D:800:7AC:N9	2.21	0.56
1:B:135:TYR:HD1	1:B:142:LEU:HD13	1.70	0.56
1:B:657:SER:HA	1:B:688:VAL:CG1	2.35	0.56
1:D:148:ILE:HG22	1:D:149:PRO:HD2	1.88	0.56
1:B:170:ASN:N	1:B:170:ASN:HD22	2.03	0.56
1:D:347:GLU:OE2	1:D:375:ILE:HG23	2.05	0.56
1:A:545:ASP:OD2	1:A:554:LYS:NZ	2.38	0.56
4:A:800:7AC:H19A	4:A:800:7AC:H1B	1.88	0.56
1:C:731:GLN:HE22	1:D:731:GLN:NE2	2.04	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:172:ILE:HG22	1:D:185:ILE:HD13	1.89	0.55
1:A:397:ILE:HD12	1:A:434:ILE:HD13	1.88	0.55
1:A:155:VAL:HG12	1:A:166:TYR:HB3	1.89	0.55
1:C:77:LEU:HD23	1:C:86:SER:HB2	1.88	0.55
1:A:237:GLU:HG2	1:A:253:ARG:HB3	1.89	0.55
1:A:540:TYR:HB2	1:A:574:ILE:HD12	1.88	0.55
1:C:180:LEU:HB3	1:C:181:PRO:HD2	1.89	0.55
1:D:207:VAL:O	1:D:358:ARG:HD3	2.07	0.54
1:B:65:ASP:CG	1:B:464:GLU:HB3	2.32	0.54
1:C:114:ILE:HG23	1:C:135:TYR:HB3	1.88	0.54
1:C:438:ASP:OD2	1:C:440:THR:HB	2.07	0.54
1:C:454:CYS:HB3	1:C:457:TYR:CZ	2.42	0.54
1:B:477:LEU:HD22	1:B:500:LEU:HD23	1.90	0.54
1:A:206:GLU:CD	1:A:666:TYR:HB2	2.33	0.54
1:D:224:ALA:HB1	1:D:268:PHE:CZ	2.43	0.54
1:D:608:GLU:O	1:D:612:GLN:HG2	2.08	0.54
1:D:554:LYS:HB3	1:D:577:SER:HB3	1.90	0.53
1:D:48:TYR:CE1	1:D:562:ASN:HA	2.43	0.53
1:D:651:ILE:HD13	1:D:755:MET:HG2	1.90	0.53
1:A:150:ASN:O	1:A:151:ASN:HB2	2.09	0.53
1:A:159:PRO:HD3	1:A:216:TRP:HB3	1.90	0.53
1:B:174:VAL:HG23	1:B:185:ILE:HD11	1.90	0.53
1:C:90:LEU:HD21	1:C:95:PHE:HE2	1.73	0.53
1:C:731:GLN:NE2	1:D:731:GLN:HE22	2.06	0.53
1:C:353:TRP:CZ2	1:C:591:MET:HE3	2.44	0.53
1:D:72:GLN:HB2	1:D:77:LEU:HD13	1.90	0.53
1:D:263:ASN:ND2	1:D:299:TYR:HE1	2.07	0.53
1:D:708:ASP:OD2	1:D:740:HIS:HB2	2.08	0.53
1:B:240:PHE:HB3	1:B:250:LYS:HG3	1.90	0.53
1:C:403:GLU:OE2	1:C:585:TYR:HA	2.09	0.53
1:A:310:ARG:NH1	1:A:368:GLY:O	2.41	0.52
1:D:389:ILE:O	1:D:389:ILE:HG22	2.09	0.52
1:D:414:TYR:CE2	1:D:435:GLN:HG2	2.36	0.52
1:C:526:TYR:HB3	1:C:578:PHE:HD1	1.74	0.52
1:D:106:SER:HB3	1:D:115:LEU:HB3	1.91	0.52
1:D:323:SER:HB3	1:D:347:GLU:HB3	1.91	0.52
1:B:154:TRP:HD1	1:B:214:LEU:HD12	1.74	0.52
1:C:598:LEU:HG	1:C:631:TYR:OH	2.09	0.52
1:A:314:GLN:NE2	1:A:362:PRO:HD3	2.25	0.52
1:C:153:GLN:OE1	1:C:170:ASN:ND2	2.43	0.52
4:B:800:7AC:H19A	4:B:800:7AC:C1	2.40	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:554:LYS:HB3	1:C:577:SER:HB3	1.91	0.52
1:B:582:GLY:HA2	1:B:594:ILE:HD12	1.92	0.52
1:A:710:ASN:HD22	1:A:710:ASN:C	2.18	0.52
1:A:597:ARG:HA	1:A:682:HIS:CD2	2.45	0.51
1:C:484:SER:O	1:C:488:ASP:HA	2.09	0.51
1:C:731:GLN:HE22	1:D:731:GLN:HE22	1.57	0.51
1:C:64:SER:HA	1:C:463:LYS:HE2	1.91	0.51
1:C:234:PRO:HB2	1:D:248:TYR:CZ	2.45	0.51
1:C:453:ARG:NH2	1:C:477:LEU:O	2.43	0.51
1:C:258:LYS:HB3	1:C:660:GLU:O	2.11	0.51
1:D:93:SER:HA	1:D:96:ASP:HB2	1.92	0.51
1:D:679:ASN:OD1	1:D:682:HIS:HB3	2.11	0.51
1:B:703:ILE:HG12	1:B:733:MET:HB3	1.93	0.51
1:D:115:LEU:HD21	1:D:155:VAL:HG21	1.92	0.51
1:A:75:ASN:HB3	1:A:92:ASN:HD22	1.76	0.51
1:C:471:ARG:HG3	1:C:480:TYR:CE1	2.46	0.51
1:A:453:ARG:HB2	1:A:476:GLY:HA3	1.93	0.51
1:B:627:TRP:HB2	1:B:651:ILE:HB	1.91	0.51
1:C:651:ILE:HG21	1:C:755:MET:HG2	1.93	0.51
1:A:80:ASN:HD22	1:A:83:TYR:H	1.59	0.50
1:A:327:ILE:HD13	1:A:389:ILE:CD1	2.41	0.50
1:C:543:LEU:HD11	1:C:627:TRP:HD1	1.76	0.50
1:A:318:ARG:HG2	5:A:873:HOH:O	2.11	0.50
1:A:159:PRO:HD3	1:A:216:TRP:CB	2.42	0.50
1:B:195:TYR:HB2	1:B:228:PHE:HB2	1.94	0.50
1:B:331:ASP:HB3	1:B:334:SER:HB3	1.94	0.50
1:D:46:THR:O	1:D:50:LYS:HB2	2.11	0.50
1:D:634:TYR:HD2	1:D:656:VAL:O	1.94	0.50
1:B:242:SER:HB3	1:B:246:LEU:HD12	1.92	0.50
1:C:375:ILE:HD12	1:C:376:SER:O	2.11	0.50
1:C:500:LEU:HG	1:C:504:LEU:HD22	1.93	0.50
1:A:327:ILE:HG21	1:A:389:ILE:HD11	1.93	0.50
1:D:472:CYS:O	1:D:478:PRO:HA	2.11	0.50
1:B:123:GLN:HB3	1:B:127:SER:OG	2.11	0.50
1:B:403:GLU:OE1	1:B:587:GLY:HA2	2.12	0.49
1:D:382:ARG:H	1:D:403:GLU:HG2	1.77	0.49
1:A:626:ILE:HG23	1:A:636:THR:HG23	1.93	0.49
1:B:153:GLN:NE2	1:B:167:VAL:HG12	2.26	0.49
1:C:237:GLU:OE2	1:D:251:THR:OG1	2.27	0.49
1:C:369:ASN:O	1:C:389:ILE:HB	2.11	0.49
1:B:159:PRO:HD3	1:B:216:TRP:CB	2.41	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:718:GLN:OE1	1:D:721:LYS:NZ	2.45	0.49
1:A:626:ILE:O	1:A:650:GLY:HA2	2.11	0.49
1:C:696:LYS:HG3	1:C:728:VAL:HG22	1.95	0.49
1:C:714:GLN:NE2	1:D:249:PRO:HD3	2.28	0.49
1:D:545:ASP:OD2	1:D:554:LYS:HE3	2.13	0.49
1:C:167:VAL:HG11	1:C:198:ILE:HG12	1.93	0.49
1:C:681:ASP:O	1:C:685:ASN:HB2	2.13	0.49
1:C:543:LEU:HD11	1:C:627:TRP:CD1	2.47	0.49
1:B:517:ILE:HD12	1:B:519:LEU:HD13	1.95	0.49
1:D:371:PHE:HE1	1:D:373:LYS:HG2	1.77	0.49
1:D:492:ARG:HB3	1:D:492:ARG:HH21	1.78	0.49
1:A:41:LYS:HD3	1:A:506:ASN:HB3	1.95	0.49
1:A:55:LEU:HD23	1:A:500:LEU:CD2	2.40	0.49
1:B:613:PHE:O	1:B:616:MET:HB2	2.13	0.49
1:C:362:PRO:HA	1:C:373:LYS:HB3	1.95	0.49
1:D:346:ILE:H	1:D:392:LYS:HZ2	1.60	0.49
1:B:193:ILE:HG22	1:B:194:ILE:HG12	1.95	0.48
1:A:206:GLU:HG3	1:A:663:ASP:OD1	2.12	0.48
1:C:129:THR:HG23	1:C:151:ASN:HA	1.95	0.48
1:D:588:ASP:HB3	1:D:592:HIS:HD2	1.77	0.48
1:B:156:THR:HG23	1:B:216:TRP:HE1	1.77	0.48
1:C:123:GLN:HB3	1:C:127:SER:OG	2.12	0.48
1:D:500:LEU:HG	1:D:504:LEU:HD22	1.94	0.48
1:D:616:MET:HB3	1:D:618:PHE:CE1	2.49	0.48
1:D:631:TYR:HD1	4:D:800:7AC:H13	1.77	0.48
1:A:232:GLU:HB3	1:A:262:VAL:HG11	1.93	0.48
1:D:415:LEU:O	1:D:434:ILE:HG22	2.13	0.48
1:D:710:ASN:C	1:D:710:ASN:HD22	2.21	0.48
1:A:313:LEU:O	1:A:325:MET:HA	2.14	0.48
1:A:453:ARG:NH2	1:A:479:LEU:HB2	2.28	0.48
1:A:415:LEU:HB2	1:A:436:LEU:HD11	1.96	0.48
1:B:95:PHE:HE1	1:B:135:TYR:CD1	2.30	0.48
1:B:364:PHE:HE2	1:B:389:ILE:HD11	1.79	0.48
1:B:471:ARG:HG3	1:B:480:TYR:CE1	2.49	0.48
1:D:549:GLY:HA2	1:D:631:TYR:CE2	2.49	0.48
1:A:703:ILE:HG21	1:A:751:ILE:CD1	2.44	0.48
1:A:326:ASP:OD2	1:A:344:GLN:HG2	2.14	0.48
1:D:637:SER:HB3	1:D:688:VAL:HG21	1.96	0.48
1:D:375:ILE:HG22	1:D:376:SER:N	2.29	0.47
1:A:75:ASN:HB3	1:A:92:ASN:H	1.79	0.47
1:B:534:PHE:HZ	1:B:618:PHE:CG	2.32	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:660:GLU:OE2	1:B:684:ARG:NH2	2.47	0.47
1:B:456:TYR:O	1:B:472:CYS:HA	2.14	0.47
1:A:529:ILE:HB	1:A:575:VAL:HG13	1.96	0.47
1:A:155:VAL:HG12	1:A:166:TYR:HB2	1.97	0.47
1:B:185:ILE:HD12	1:B:185:ILE:N	2.29	0.47
1:C:598:LEU:HD22	1:C:671:MET:HG2	1.97	0.47
1:C:626:ILE:O	1:C:650:GLY:HA2	2.13	0.47
1:D:482:LEU:HB2	1:D:494:LEU:HD21	1.97	0.47
1:D:596:ARG:C	1:D:597:ARG:HD2	2.40	0.47
1:B:116:LEU:O	1:B:132:TYR:HA	2.14	0.47
1:C:543:LEU:O	1:C:575:VAL:HA	2.15	0.47
1:C:640:LEU:HD11	1:C:650:GLY:HA3	1.97	0.47
1:D:586:GLN:HB3	1:D:590:ILE:HD12	1.96	0.47
1:B:410:LEU:HD13	1:B:415:LEU:HD23	1.96	0.47
1:B:669:ARG:HD2	1:B:670:TYR:CZ	2.50	0.47
1:C:751:ILE:HG12	1:C:755:MET:HE2	1.97	0.47
1:D:420:ASN:HB2	1:D:426:PRO:HA	1.97	0.47
1:A:352:GLY:HA3	1:A:592:HIS:ND1	2.30	0.47
1:B:129:THR:HG23	1:B:151:ASN:HA	1.97	0.47
1:A:230:ASP:O	1:A:231:THR:C	2.58	0.46
1:C:365:THR:O	1:C:368:GLY:N	2.45	0.46
1:C:626:ILE:HG23	1:C:636:THR:HG23	1.97	0.46
1:D:196:ASN:OD1	1:D:227:GLN:HG3	2.15	0.46
1:A:112:GLN:HG2	1:A:138:ASN:HD21	1.80	0.46
1:C:157:TRP:CE3	1:C:164:LEU:HD13	2.50	0.46
1:A:127:SER:HB3	1:A:211:TYR:CD2	2.51	0.46
1:B:317:ARG:HD2	1:B:322:TYR:HB3	1.96	0.46
1:D:95:PHE:HE1	1:D:135:TYR:CD1	2.33	0.46
1:A:397:ILE:HG22	1:A:439:TYR:CE2	2.49	0.46
1:B:154:TRP:CE2	1:B:212:SER:HB2	2.50	0.46
1:B:334:SER:OG	1:B:336:ARG:HG3	2.15	0.46
1:B:382:ARG:HH21	1:B:591:MET:HE1	1.80	0.46
1:D:289:ALA:HB3	1:D:294:LEU:HD21	1.96	0.46
1:D:492:ARG:HB3	1:D:492:ARG:NH2	2.30	0.46
1:A:453:ARG:HG3	1:A:454:CYS:SG	2.55	0.46
1:C:174:VAL:HG23	1:C:185:ILE:HD11	1.98	0.46
1:D:224:ALA:HB1	1:D:268:PHE:HZ	1.79	0.46
1:A:129:THR:HG22	1:A:151:ASN:HA	1.97	0.46
1:C:499:ALA:O	1:C:502:LYS:HB3	2.16	0.46
1:D:305:TRP:CE2	1:D:311:ILE:HD12	2.51	0.46
1:B:438:ASP:OD2	1:B:440:THR:HB	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:564:ALA:HB1	1:D:575:VAL:HG21	1.97	0.46
1:C:657:SER:HA	1:C:688:VAL:HG13	1.97	0.46
1:A:376:SER:HA	1:A:382:ARG:HA	1.96	0.46
1:A:598:LEU:HB2	1:A:671:MET:SD	2.56	0.46
1:C:201:TRP:CZ2	1:C:710:ASN:HA	2.51	0.46
1:C:455:GLN:HB2	1:C:475:PRO:HD3	1.98	0.46
1:C:462:SER:O	1:C:463:LYS:C	2.59	0.46
1:B:289:ALA:HB3	1:B:294:LEU:CD2	2.46	0.45
1:D:657:SER:HA	1:D:688:VAL:CG1	2.46	0.45
1:B:530:LEU:HA	1:B:531:PRO:HD2	1.83	0.45
1:D:119:ASN:HB2	1:D:131:SER:HB2	1.98	0.45
1:D:148:ILE:HD12	1:D:148:ILE:H	1.81	0.45
1:D:376:SER:HA	1:D:382:ARG:HA	1.98	0.45
1:A:446:SER:HA	1:A:449:LEU:HG	1.98	0.45
1:D:302:ASP:HB3	1:D:314:GLN:HB2	1.98	0.45
1:A:370:SER:OG	1:A:386:TYR:CE2	2.68	0.45
1:A:543:LEU:O	1:A:575:VAL:HA	2.16	0.45
1:A:688:VAL:HG22	1:A:719:ILE:HG12	1.99	0.45
1:B:689:MET:HG3	1:B:722:ALA:HB2	1.98	0.45
1:C:527:GLN:HG2	1:C:555:ALA:HA	1.97	0.45
1:C:662:TYR:OH	1:C:710:ASN:ND2	2.49	0.45
1:A:640:LEU:HB3	1:A:698:VAL:HG21	1.98	0.45
1:C:232:GLU:HB2	1:C:262:VAL:HG11	1.98	0.45
1:A:397:ILE:CD1	1:A:434:ILE:HD13	2.46	0.45
1:A:546:VAL:HG23	1:A:632:GLY:HA2	1.99	0.45
1:A:640:LEU:HD11	1:A:650:GLY:HA3	1.99	0.45
1:C:517:ILE:CD1	1:C:612:GLN:HG3	2.47	0.45
1:C:542:LEU:C	1:C:542:LEU:HD23	2.41	0.45
1:A:258:LYS:HD2	1:B:247:GLN:HG2	1.98	0.45
1:B:235:LEU:HA	1:B:254:VAL:O	2.17	0.45
1:B:466:LYS:HD2	1:B:467:TYR:CE1	2.51	0.45
1:C:415:LEU:HB3	1:C:434:ILE:HG13	1.97	0.45
1:D:65:ASP:HA	1:D:462:SER:HB2	1.98	0.45
1:B:195:TYR:HB3	1:B:198:ILE:O	2.17	0.45
1:D:169:ASN:O	1:D:170:ASN:HB2	2.17	0.45
1:C:90:LEU:HD21	1:C:95:PHE:CE2	2.52	0.44
1:B:471:ARG:CG	1:B:480:TYR:CE1	3.00	0.44
1:D:191:GLU:O	1:D:192:ASP:HB2	2.17	0.44
1:A:741:GLY:O	1:A:742:ILE:C	2.60	0.44
1:A:153:GLN:HB3	1:A:211:TYR:CE1	2.52	0.44
1:B:81:ALA:O	1:B:492:ARG:NH1	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:454:CYS:HB3	1:D:457:TYR:CE2	2.52	0.44
1:D:733:MET:HG3	1:D:735:TYR:CE2	2.53	0.44
1:B:152:THR:HG21	1:B:155:VAL:HG22	1.98	0.44
1:B:336:ARG:HB2	1:B:336:ARG:NH1	2.29	0.44
1:B:598:LEU:HB2	1:B:671:MET:SD	2.57	0.44
1:C:582:GLY:HA2	1:C:594:ILE:HG12	1.99	0.44
1:D:217:SER:HB3	1:D:222:PHE:HB2	2.00	0.44
1:D:559:PHE:CZ	1:D:561:LEU:HD21	2.53	0.44
1:D:666:TYR:CE1	1:D:670:TYR:HE2	2.36	0.44
1:C:109:PRO:HG2	1:C:158:SER:O	2.18	0.44
1:B:507:VAL:CG2	1:B:509:MET:HE2	2.46	0.44
1:C:191:GLU:O	1:C:193:ILE:HD12	2.17	0.44
1:C:723:LEU:HD22	1:C:728:VAL:HG11	2.00	0.44
1:D:148:ILE:CG2	1:D:149:PRO:HD2	2.47	0.44
1:A:621:ASN:ND2	1:A:621:ASN:H	2.14	0.44
1:B:365:THR:O	1:B:366:LEU:C	2.61	0.44
1:A:285:ILE:HG21	1:A:336:ARG:HA	2.00	0.43
1:A:453:ARG:HH21	1:A:479:LEU:HB2	1.83	0.43
1:A:446:SER:O	1:A:447:CYS:C	2.61	0.43
1:B:347:GLU:OE1	1:B:373:LYS:NZ	2.50	0.43
1:C:214:LEU:HD23	1:C:225:TYR:HB3	2.00	0.43
1:D:263:ASN:ND2	1:D:299:TYR:CE1	2.86	0.43
1:D:564:ALA:CB	1:D:575:VAL:HG21	2.49	0.43
1:A:554:LYS:HB3	1:A:577:SER:CB	2.47	0.43
1:D:703:ILE:HG12	1:D:733:MET:HB3	2.00	0.43
1:B:62:TRP:CG	1:B:462:SER:HA	2.53	0.43
1:B:603:VAL:HG13	1:B:639:VAL:HG23	1.99	0.43
1:C:261:ALA:O	1:C:318:ARG:NH1	2.42	0.43
1:C:597:ARG:NH1	1:C:679:ASN:OD1	2.52	0.43
1:A:405:ILE:HG12	1:A:419:SER:HA	2.00	0.43
1:C:322:TYR:CE1	1:C:348:MET:HE2	2.53	0.43
1:C:415:LEU:HB3	1:C:434:ILE:CG1	2.48	0.43
1:D:246:LEU:HD23	1:D:246:LEU:HA	1.92	0.43
1:C:242:SER:HB3	1:C:246:LEU:HD12	2.01	0.43
1:D:604:GLU:HA	1:D:607:ILE:HD12	1.99	0.43
1:C:134:ILE:HG22	1:C:135:TYR:N	2.34	0.43
1:C:642:SER:OG	1:C:644:SER:HB3	2.18	0.43
1:D:531:PRO:HB3	1:D:572:ASN:HD22	1.84	0.43
1:D:657:SER:HA	1:D:688:VAL:HG12	2.00	0.43
1:A:427:GLY:HA2	1:A:553:GLN:OE1	2.19	0.43
1:A:588:ASP:O	1:A:592:HIS:HB2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:77:LEU:HD13	1:B:88:VAL:HA	2.00	0.43
1:B:316:LEU:HD22	1:B:320:GLN:HA	2.01	0.43
1:B:327:ILE:HG12	1:B:389:ILE:HD12	2.00	0.43
1:C:475:PRO:HA	1:C:557:THR:O	2.19	0.43
1:A:561:LEU:HD23	1:A:561:LEU:HA	1.90	0.43
1:B:77:LEU:HD12	1:B:86:SER:HB2	1.99	0.43
1:B:242:SER:OG	1:B:243:ASP:N	2.47	0.43
1:B:356:ARG:NH2	1:B:403:GLU:OE2	2.47	0.43
1:C:42:THR:HG22	1:C:508:GLN:HG3	2.00	0.43
1:D:651:ILE:HG12	1:D:701:LEU:HB3	2.01	0.43
1:B:407:ILE:HG23	1:B:415:LEU:HD21	2.00	0.42
1:D:195:TYR:O	1:D:227:GLN:HA	2.18	0.42
1:A:417:TYR:HE1	1:A:419:SER:HB3	1.84	0.42
1:B:109:PRO:HG2	1:B:158:SER:O	2.19	0.42
1:B:674:PRO:O	1:B:680:LEU:HD13	2.19	0.42
1:D:167:VAL:HG21	1:D:198:ILE:HG23	1.99	0.42
1:D:735:TYR:OH	1:D:751:ILE:HA	2.18	0.42
1:A:598:LEU:O	1:A:682:HIS:NE2	2.50	0.42
1:D:201:TRP:CZ2	1:D:710:ASN:HA	2.54	0.42
1:A:696:LYS:HG3	1:A:728:VAL:CG2	2.43	0.42
1:B:346:ILE:HG21	1:B:348:MET:HE2	1.99	0.42
1:C:695:PHE:C	1:C:697:GLN:H	2.26	0.42
1:D:159:PRO:HD3	1:D:216:TRP:CB	2.49	0.42
1:A:677:GLU:H	1:A:677:GLU:CD	2.27	0.42
1:B:290:PRO:HD3	1:B:315:TRP:CD1	2.55	0.42
1:B:504:LEU:C	1:B:506:ASN:H	2.28	0.42
1:C:376:SER:HA	1:C:382:ARG:HA	2.01	0.42
1:A:224:ALA:HB1	1:A:268:PHE:CZ	2.54	0.42
1:B:159:PRO:HD3	1:B:216:TRP:HB3	2.01	0.42
1:B:230:ASP:O	1:B:231:THR:C	2.63	0.42
1:B:389:ILE:HD13	1:B:389:ILE:HA	1.86	0.42
1:A:417:TYR:CE1	1:A:419:SER:HB3	2.55	0.42
1:B:259:ALA:HB3	1:B:660:GLU:HA	2.01	0.42
1:B:513:LYS:O	1:B:527:GLN:HA	2.20	0.42
1:D:547:TYR:C	1:D:547:TYR:CD1	2.96	0.42
1:D:661:TYR:OH	1:D:718:GLN:HG3	2.20	0.42
1:B:50:LYS:O	1:B:51:ASN:C	2.62	0.42
1:B:598:LEU:HG	1:B:631:TYR:OH	2.20	0.42
1:B:117:GLU:HB2	1:B:132:TYR:CE2	2.55	0.42
1:B:340:LEU:HB2	1:B:343:ARG:CG	2.49	0.42
1:D:183:TYR:O	1:D:185:ILE:HD12	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:487:ASN:OD1	1:A:489:LYS:HG2	2.20	0.42
1:B:167:VAL:HA	1:B:171:ASP:O	2.20	0.42
1:B:384:ILE:HG13	1:B:404:VAL:HG21	2.01	0.42
1:C:303:VAL:HG22	1:C:313:LEU:HD12	2.01	0.42
1:A:153:GLN:NE2	1:A:170:ASN:H	2.07	0.41
1:A:631:TYR:HD1	4:A:800:7AC:H13	1.84	0.41
1:B:379:GLU:OE2	1:B:379:GLU:HA	2.20	0.41
1:D:90:LEU:HD21	1:D:95:PHE:HE2	1.84	0.41
1:C:654:ALA:N	1:C:655:PRO:HD3	2.35	0.41
1:D:299:TYR:OH	1:D:318:ARG:HG3	2.20	0.41
1:A:47:ASP:HA	1:A:52:THR:OG1	2.20	0.41
1:A:177:GLU:HB2	1:A:180:LEU:HD13	2.02	0.41
1:A:475:PRO:HA	1:A:557:THR:O	2.19	0.41
1:B:336:ARG:NH1	1:B:337:TRP:O	2.54	0.41
1:B:340:LEU:HB2	1:B:343:ARG:HG3	2.02	0.41
1:B:654:ALA:N	1:B:655:PRO:CD	2.83	0.41
1:C:51:ASN:ND2	1:C:54:ARG:HD2	2.32	0.41
1:C:627:TRP:HB2	1:C:651:ILE:HB	2.02	0.41
1:B:299:TYR:CE1	1:B:665:VAL:HG22	2.56	0.41
1:C:134:ILE:HD11	1:C:148:ILE:HD11	2.03	0.41
1:C:172:ILE:HG22	1:C:185:ILE:HD13	2.01	0.41
1:B:206:GLU:CD	1:B:666:TYR:HB2	2.45	0.41
1:B:310:ARG:HH21	1:B:343:ARG:NH1	2.18	0.41
1:D:127:SER:HB3	1:D:211:TYR:CD2	2.56	0.41
1:A:205:GLU:OE1	4:A:800:7AC:N20	2.53	0.41
1:B:62:TRP:CE3	1:B:68:TYR:HB3	2.56	0.41
1:B:95:PHE:CE1	1:B:116:LEU:HD11	2.56	0.41
1:B:402:TRP:CD2	1:B:421:GLU:HB2	2.55	0.41
1:B:214:LEU:HD23	1:B:225:TYR:HB3	2.03	0.41
1:B:293:MET:HG3	1:B:315:TRP:HB3	2.02	0.41
1:D:172:ILE:H	1:D:186:THR:HG1	1.67	0.41
1:D:330:TYR:HB2	1:D:337:TRP:CH2	2.56	0.41
1:A:223:LEU:HB3	1:A:271:VAL:HG13	2.02	0.41
1:A:236:ILE:O	1:A:253:ARG:HA	2.20	0.41
1:A:630:SER:HB2	4:A:800:7AC:N9	2.36	0.41
1:B:290:PRO:HG3	1:B:326:ASP:OD1	2.21	0.41
1:B:504:LEU:C	1:B:506:ASN:N	2.78	0.41
1:C:675:THR:C	1:C:680:LEU:HB2	2.46	0.41
1:D:237:GLU:HG2	1:D:253:ARG:HG2	2.02	0.41
1:A:598:LEU:HD23	1:A:659:TRP:CE2	2.56	0.41
1:B:200:ASP:O	1:B:201:TRP:C	2.63	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:630:SER:HB2	1:B:631:TYR:H	1.55	0.41
1:C:703:ILE:HA	1:C:733:MET:O	2.21	0.41
1:B:453:ARG:NH2	1:B:477:LEU:O	2.48	0.40
1:B:545:ASP:HB3	1:B:577:SER:OG	2.21	0.40
1:B:712:HIS:C	1:B:714:GLN:N	2.79	0.40
1:C:229:ASN:O	1:C:264:PRO:HA	2.20	0.40
1:C:624:ILE:HG22	1:C:647:PHE:CD2	2.57	0.40
1:D:177:GLU:C	1:D:179:ASN:H	2.28	0.40
1:A:658:ARG:HD3	1:A:661:TYR:CZ	2.56	0.40
1:B:169:ASN:O	1:B:170:ASN:HB2	2.21	0.40
1:B:403:GLU:OE2	1:B:585:TYR:HA	2.21	0.40
1:B:541:PRO:HG3	1:B:623:ARG:CZ	2.52	0.40
1:B:765:LEU:HA	1:B:766:PRO:HD3	1.88	0.40
1:D:257:PRO:HG3	1:D:264:PRO:HD3	2.03	0.40
1:D:641:GLY:O	1:D:691:ARG:HB3	2.21	0.40
1:A:96:ASP:OD1	1:A:96:ASP:N	2.52	0.40
1:A:370:SER:HG	1:A:386:TYR:HE2	1.58	0.40
1:A:703:ILE:HA	1:A:733:MET:O	2.22	0.40
1:C:197:GLY:C	1:C:213:ALA:HB3	2.47	0.40
1:C:319:ILE:HD12	1:C:319:ILE:H	1.86	0.40
1:C:405:ILE:HG13	1:C:429:ARG:CD	2.50	0.40
1:D:456:TYR:HB2	1:D:557:THR:OG1	2.21	0.40
1:A:111:GLY:O	1:A:137:LEU:HD12	2.22	0.40
1:A:234:PRO:HB2	1:B:248:TYR:CZ	2.57	0.40
1:B:448:GLU:O	1:B:449:LEU:C	2.65	0.40
1:C:612:GLN:HA	1:C:612:GLN:HE21	1.86	0.40
1:C:631:TYR:O	1:C:634:TYR:HB3	2.22	0.40
1:D:90:LEU:HD21	1:D:95:PHE:CE2	2.56	0.40
1:A:306:ALA:HB3	1:A:310:ARG:HG2	2.03	0.40
1:B:80:ASN:C	1:B:80:ASN:HD22	2.29	0.40
1:B:153:GLN:HB3	1:B:211:TYR:CE1	2.56	0.40
1:C:707:ALA:HB2	1:C:737:ASP:HA	2.04	0.40
1:C:708:ASP:CG	1:C:711:VAL:O	2.65	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	A	720/740 (97%)	675 (94%)	44 (6%)	1 (0%)	48	72
1	B	720/740 (97%)	667 (93%)	50 (7%)	3 (0%)	30	52
1	C	720/740 (97%)	668 (93%)	50 (7%)	2 (0%)	36	59
1	D	720/740 (97%)	642 (89%)	76 (11%)	2 (0%)	36	59
All	All	2880/2960 (97%)	2652 (92%)	220 (8%)	8 (0%)	36	59

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	678	ASP
1	B	366	LEU
1	A	124	TRP
1	D	282	ALA
1	D	447	CYS
1	B	389	ILE
1	C	88	VAL
1	B	88	VAL

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	649/662 (98%)	598 (92%)	51 (8%)	11	27
1	B	649/662 (98%)	601 (93%)	48 (7%)	13	30

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	649/662 (98%)	604 (93%)	45 (7%)	14	33
1	D	649/662 (98%)	605 (93%)	44 (7%)	14	33
All	All	2596/2648 (98%)	2408 (93%)	188 (7%)	13	31

All (188) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	41	LYS
1	A	57	LEU
1	A	59	SER
1	A	66	HIS
1	A	75	ASN
1	A	78	VAL
1	A	90	LEU
1	A	129	THR
1	A	142	LEU
1	A	145	GLU
1	A	180	LEU
1	A	191	GLU
1	A	202	VAL
1	A	242	SER
1	A	246	LEU
1	A	254	VAL
1	A	276	LEU
1	A	283	THR
1	A	316	LEU
1	A	339	CYS
1	A	376	SER
1	A	382	ARG
1	A	385	CYS
1	A	391	LYS
1	A	410	LEU
1	A	415	LEU
1	A	436	LEU
1	A	443	THR
1	A	453	ARG
1	A	464	GLU
1	A	482	LEU
1	A	498	SER
1	A	504	LEU
1	A	505	GLN

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Mol	Chain	Res	Type
1	A	506	ASN
1	A	507	VAL
1	A	514	LEU
1	A	522	THR
1	A	523	LYS
1	A	536	LYS
1	A	538	LYS
1	A	546	VAL
1	A	547	TYR
1	A	575	VAL
1	A	621	ASN
1	A	630	SER
1	A	660	GLU
1	A	673	LEU
1	A	688	VAL
1	A	760	LYS
1	A	761	GLN
1	B	50	LYS
1	B	80	ASN
1	B	90	LEU
1	B	107	ILE
1	B	123	GLN
1	B	129	THR
1	B	143	ILE
1	B	155	VAL
1	B	170	ASN
1	B	190	LYS
1	B	246	LEU
1	B	276	LEU
1	B	316	LEU
1	B	326	ASP
1	B	327	ILE
1	B	336	ARG
1	B	339	CYS
1	B	365	THR
1	B	373	LYS
1	B	385	CYS
1	B	389	ILE
1	B	399	LYS
1	B	413	ASP
1	B	440	THR
1	B	448	GLU

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Mol	Chain	Res	Type
1	B	453	ARG
1	B	463	LYS
1	B	472	CYS
1	B	482	LEU
1	B	492	ARG
1	B	502	LYS
1	B	505	GLN
1	B	507	VAL
1	B	514	LEU
1	B	536	LYS
1	B	538	LYS
1	B	547	TYR
1	B	594	ILE
1	B	597	ARG
1	B	598	LEU
1	B	615	LYS
1	B	630	SER
1	B	639	VAL
1	B	673	LEU
1	B	677	GLU
1	B	684	ARG
1	B	685	ASN
1	B	688	VAL
1	C	54	ARG
1	C	66	HIS
1	C	80	ASN
1	C	88	VAL
1	C	90	LEU
1	C	91	GLU
1	C	129	THR
1	C	155	VAL
1	C	170	ASN
1	C	202	VAL
1	C	243	ASP
1	C	246	LEU
1	C	297	ASP
1	C	316	LEU
1	C	340	LEU
1	C	350	THR
1	C	354	VAL
1	C	375	ILE
1	C	385	CYS

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Mol	Chain	Res	Type
1	C	389	ILE
1	C	395	THR
1	C	415	LEU
1	C	434	ILE
1	C	441	LYS
1	C	453	ARG
1	C	472	CYS
1	C	482	LEU
1	C	504	LEU
1	C	507	VAL
1	C	514	LEU
1	C	519	LEU
1	C	533	HIS
1	C	536	LYS
1	C	575	VAL
1	C	589	LYS
1	C	597	ARG
1	C	598	LEU
1	C	612	GLN
1	C	615	LYS
1	C	673	LEU
1	C	685	ASN
1	C	688	VAL
1	C	699	GLU
1	C	710	ASN
1	C	761	GLN
1	D	51	ASN
1	D	80	ASN
1	D	92	ASN
1	D	102	ILE
1	D	110	ASP
1	D	129	THR
1	D	134	ILE
1	D	141	GLN
1	D	148	ILE
1	D	151	ASN
1	D	170	ASN
1	D	186	THR
1	D	227	GLN
1	D	246	LEU
1	D	250	LYS
1	D	254	VAL

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Mol	Chain	Res	Type
1	D	295	ILE
1	D	304	THR
1	D	307	THR
1	D	316	LEU
1	D	336	ARG
1	D	341	VAL
1	D	365	THR
1	D	373	LYS
1	D	375	ILE
1	D	388	GLN
1	D	391	LYS
1	D	392	LYS
1	D	419	SER
1	D	443	THR
1	D	453	ARG
1	D	502	LYS
1	D	504	LEU
1	D	507	VAL
1	D	514	LEU
1	D	575	VAL
1	D	622	LYS
1	D	627	TRP
1	D	630	SER
1	D	677	GLU
1	D	686	SER
1	D	688	VAL
1	D	721	LYS
1	D	762	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (77) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	51	ASN
1	A	75	ASN
1	A	80	ASN
1	A	92	ASN
1	A	112	GLN
1	A	123	GLN
1	A	138	ASN
1	A	141	GLN
1	A	153	GLN
1	A	170	ASN

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Mol	Chain	Res	Type
1	A	344	GLN
1	A	388	GLN
1	A	455	GLN
1	A	505	GLN
1	A	572	ASN
1	A	586	GLN
1	A	621	ASN
1	A	710	ASN
1	A	761	GLN
1	B	80	ASN
1	B	100	HIS
1	B	112	GLN
1	B	123	GLN
1	B	141	GLN
1	B	151	ASN
1	B	153	GLN
1	B	169	ASN
1	B	170	ASN
1	B	227	GLN
1	B	320	GLN
1	B	338	ASN
1	B	344	GLN
1	B	435	GLN
1	B	455	GLN
1	B	572	ASN
1	B	592	HIS
1	B	612	GLN
1	B	685	ASN
1	B	697	GLN
1	B	710	ASN
1	B	731	GLN
1	B	748	HIS
1	C	51	ASN
1	C	80	ASN
1	C	126	HIS
1	C	138	ASN
1	C	153	GLN
1	C	169	ASN
1	C	170	ASN
1	C	227	GLN
1	C	344	GLN
1	C	430	ASN

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Mol	Chain	Res	Type
1	C	455	GLN
1	C	505	GLN
1	C	572	ASN
1	C	586	GLN
1	C	595	ASN
1	C	612	GLN
1	C	710	ASN
1	C	731	GLN
1	D	75	ASN
1	D	85	ASN
1	D	123	GLN
1	D	138	ASN
1	D	141	GLN
1	D	169	ASN
1	D	170	ASN
1	D	388	GLN
1	D	430	ASN
1	D	435	GLN
1	D	505	GLN
1	D	527	GLN
1	D	572	ASN
1	D	606	GLN
1	D	710	ASN
1	D	731	GLN
1	D	748	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

8 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	E	1	1,2	14,14,15	0.58	0	17,19,21	0.68	0
2	NAG	E	2	2	14,14,15	0.49	0	17,19,21	0.77	0
2	NAG	F	1	1,2	14,14,15	0.52	0	17,19,21	1.07	1 (5%)
2	NAG	F	2	2	14,14,15	0.55	0	17,19,21	0.99	1 (5%)
2	NAG	G	1	1,2	14,14,15	0.65	0	17,19,21	0.87	0
2	NAG	G	2	2	14,14,15	0.49	0	17,19,21	1.18	1 (5%)
2	NAG	H	1	1,2	14,14,15	0.48	0	17,19,21	1.07	1 (5%)
2	NAG	H	2	2	14,14,15	0.64	0	17,19,21	1.22	1 (5%)

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
2	NAG	E	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1
2	NAG	F	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	F	2	2	-	3/6/23/26	0/1/1/1
2	NAG	G	1	1,2	-	1/6/23/26	0/1/1/1
2	NAG	G	2	2	-	4/6/23/26	0/1/1/1
2	NAG	H	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	H	2	2	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	2	NAG	C1-O5-C5	3.61	117.03	112.19
2	F	2	NAG	C4-C3-C2	2.67	114.93	111.02
2	F	1	NAG	C2-N2-C7	-2.61	119.40	122.90
2	H	1	NAG	C1-O5-C5	2.28	115.25	112.19
2	H	2	NAG	O4-C4-C5	2.02	114.30	109.32

There are no chirality outliers.

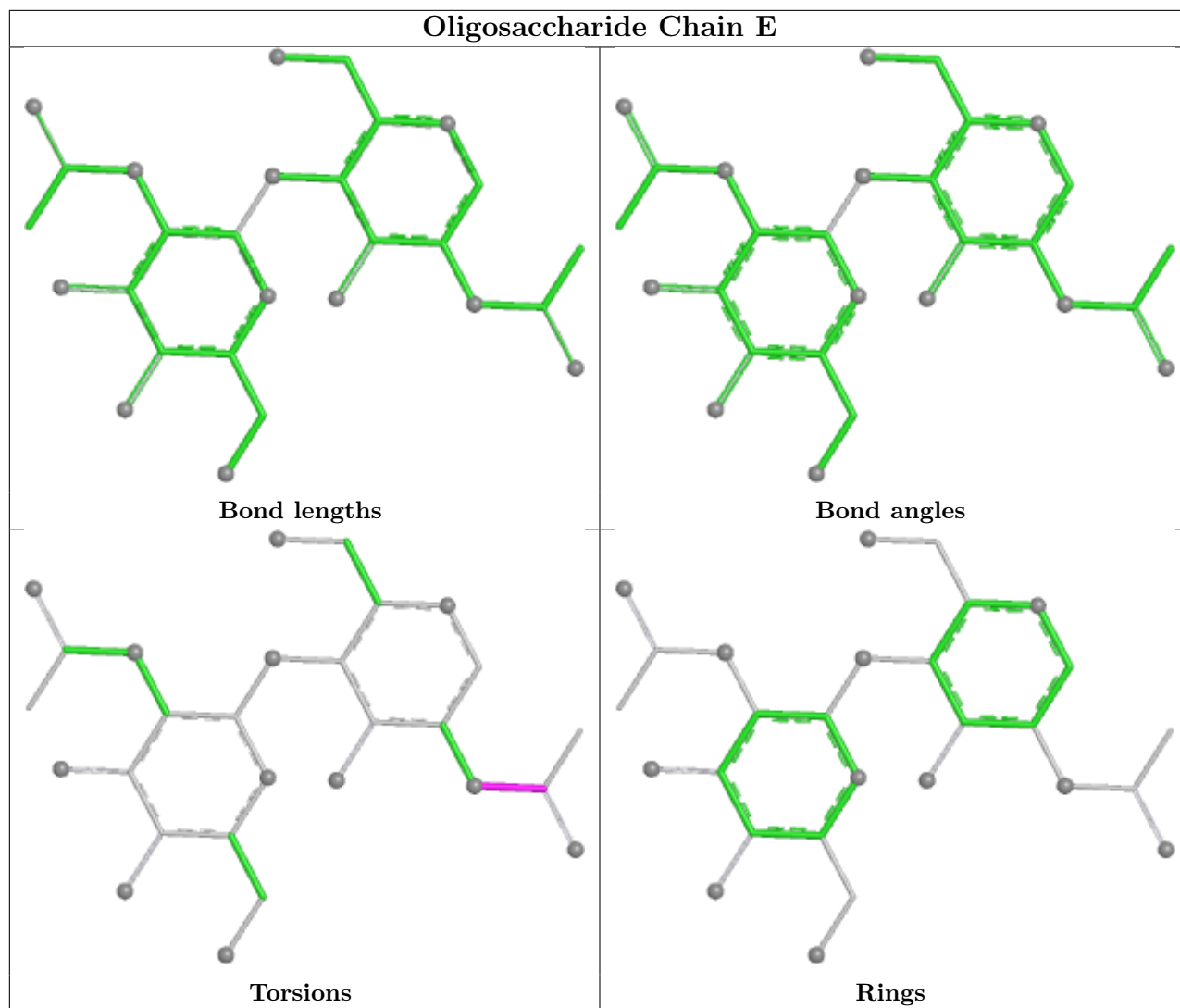
All (14) torsion outliers are listed below:

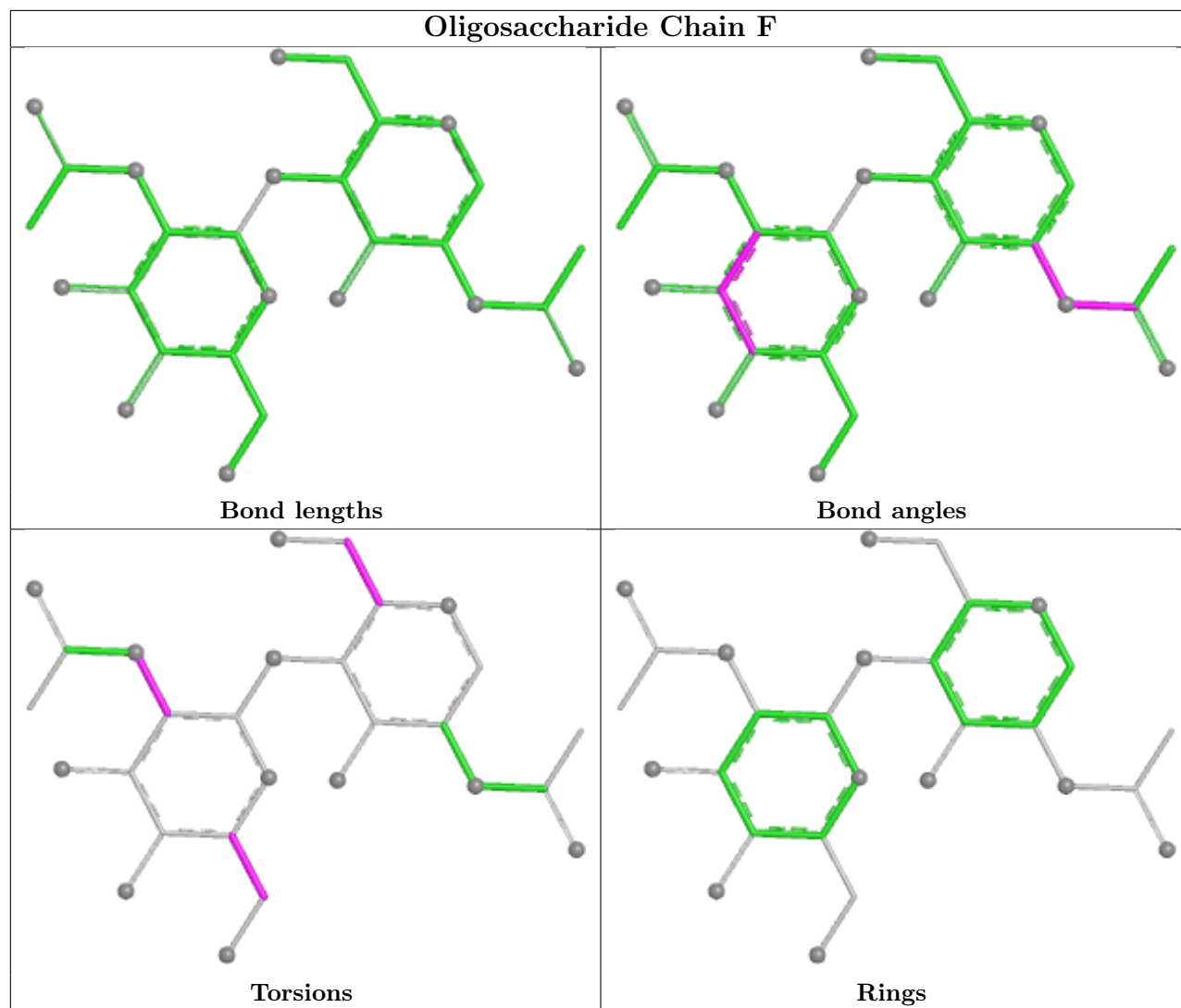
Mol	Chain	Res	Type	Atoms
2	E	1	NAG	C8-C7-N2-C2
2	E	1	NAG	O7-C7-N2-C2
2	G	2	NAG	C8-C7-N2-C2
2	G	2	NAG	O7-C7-N2-C2
2	H	1	NAG	C8-C7-N2-C2
2	G	2	NAG	O5-C5-C6-O6
2	G	2	NAG	C4-C5-C6-O6
2	H	1	NAG	O7-C7-N2-C2
2	F	2	NAG	C4-C5-C6-O6
2	F	2	NAG	O5-C5-C6-O6
2	G	1	NAG	C4-C5-C6-O6
2	F	1	NAG	C4-C5-C6-O6
2	F	2	NAG	C1-C2-N2-C7
2	F	1	NAG	O5-C5-C6-O6

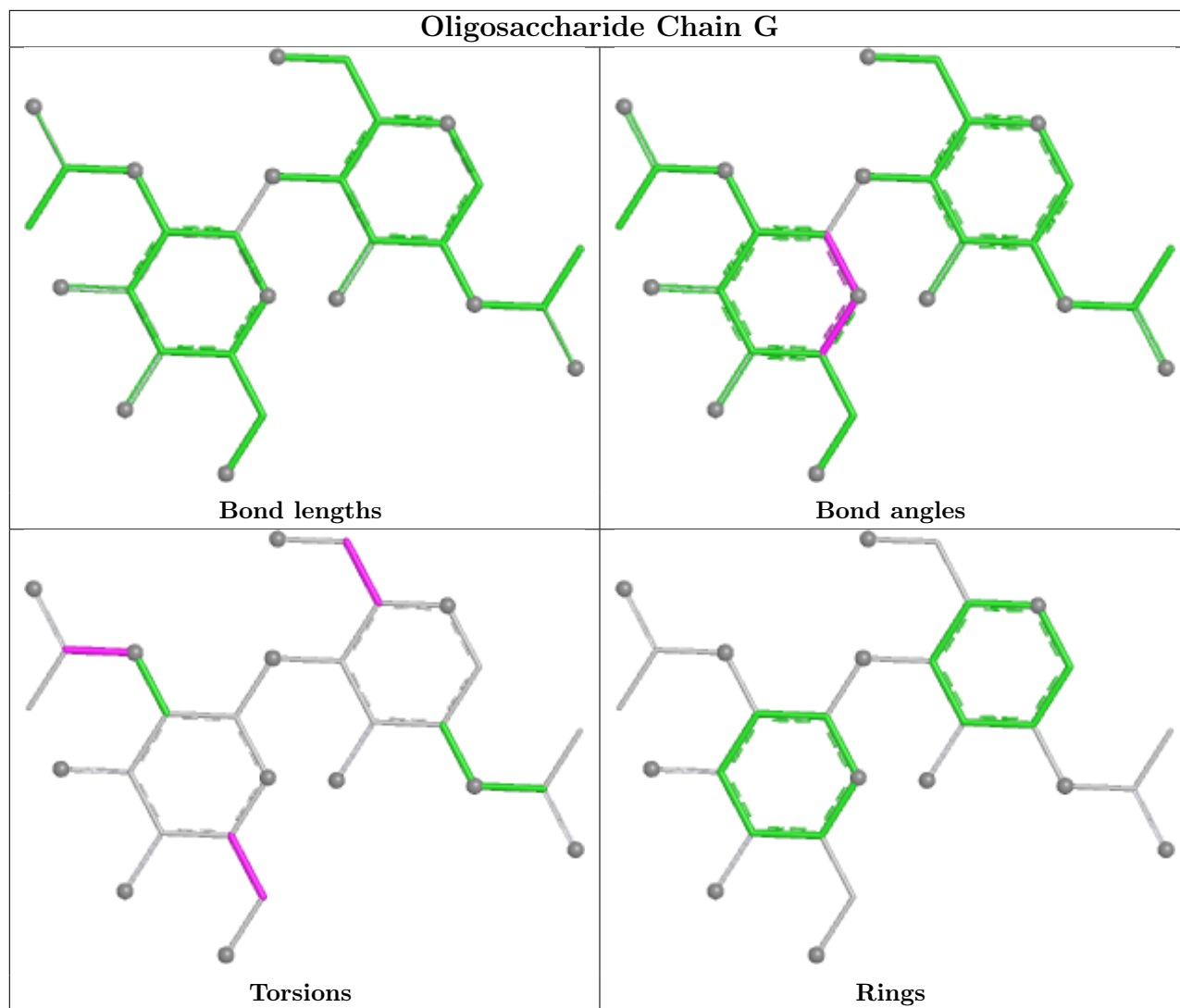
There are no ring outliers.

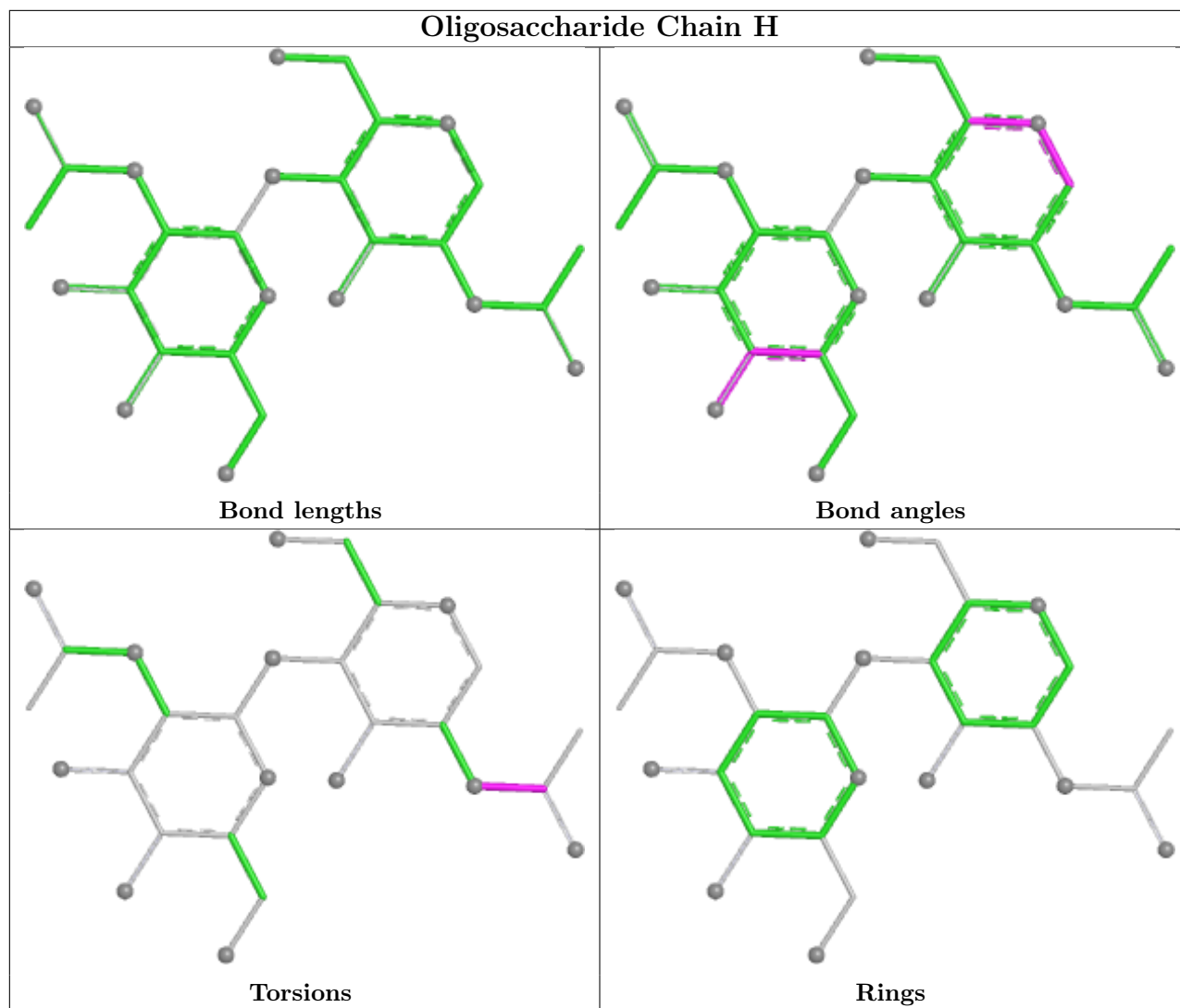
No monomer is involved in short contacts.

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](#)

16 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
3	NAG	C	804	1	14,14,15	0.82	1 (7%)	17,19,21	1.24	2 (11%)
3	NAG	D	804	1	14,14,15	0.74	1 (7%)	17,19,21	1.29	1 (5%)
3	NAG	A	803	1	14,14,15	0.67	0	17,19,21	1.00	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	C	801	1	14,14,15	0.73	0	17,19,21	1.24	1 (5%)
4	7AC	A	800	-	23,23,23	0.73	1 (4%)	26,33,33	1.80	4 (15%)
4	7AC	C	800	-	23,23,23	0.69	1 (4%)	26,33,33	1.50	3 (11%)
3	NAG	B	802	1	14,14,15	0.84	1 (7%)	17,19,21	1.64	2 (11%)
4	7AC	B	800	-	23,23,23	0.78	0	26,33,33	1.65	4 (15%)
3	NAG	D	801	1	14,14,15	0.65	0	17,19,21	1.41	1 (5%)
3	NAG	C	805	1	14,14,15	0.64	0	17,19,21	1.48	1 (5%)
3	NAG	B	805	1	14,14,15	0.63	0	17,19,21	1.42	1 (5%)
3	NAG	A	801	1	14,14,15	0.60	0	17,19,21	1.34	2 (11%)
4	7AC	D	800	-	23,23,23	0.65	1 (4%)	26,33,33	1.85	4 (15%)
3	NAG	A	806	1	14,14,15	0.56	0	17,19,21	1.70	2 (11%)
3	NAG	B	801	1	14,14,15	0.60	0	17,19,21	1.10	1 (5%)
3	NAG	A	802	1	14,14,15	0.53	0	17,19,21	1.55	2 (11%)

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	NAG	C	804	1	1/1/5/7	2/6/23/26	0/1/1/1
3	NAG	D	804	1	-	4/6/23/26	0/1/1/1
3	NAG	A	803	1	-	2/6/23/26	0/1/1/1
3	NAG	C	801	1	-	4/6/23/26	0/1/1/1
4	7AC	A	800	-	-	0/7/8/8	0/3/3/3
4	7AC	C	800	-	-	0/7/8/8	0/3/3/3
3	NAG	B	802	1	-	5/6/23/26	0/1/1/1
4	7AC	B	800	-	-	0/7/8/8	0/3/3/3
3	NAG	D	801	1	-	2/6/23/26	0/1/1/1
3	NAG	C	805	1	-	2/6/23/26	0/1/1/1
3	NAG	B	805	1	-	4/6/23/26	0/1/1/1
3	NAG	A	801	1	-	4/6/23/26	0/1/1/1
4	7AC	D	800	-	-	0/7/8/8	0/3/3/3
3	NAG	A	806	1	-	2/6/23/26	0/1/1/1
3	NAG	B	801	1	-	4/6/23/26	0/1/1/1
3	NAG	A	802	1	-	2/6/23/26	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	804	NAG	C1-C2	2.49	1.55	1.52
3	D	804	NAG	C1-C2	2.31	1.55	1.52
3	B	802	NAG	C1-C2	2.22	1.55	1.52
4	A	800	7AC	C11-C10	-2.07	1.47	1.50
4	D	800	7AC	C5-N4	-2.06	1.35	1.39
4	C	800	7AC	C10-C7	2.00	1.43	1.41

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	800	7AC	C10-C11-C16	-6.01	115.40	122.31
4	A	800	7AC	C10-C11-C16	-5.70	115.76	122.31
3	A	806	NAG	C1-O5-C5	5.16	119.10	112.19
3	D	801	NAG	C1-O5-C5	5.06	118.97	112.19
4	B	800	7AC	C10-C11-C16	-5.05	116.51	122.31
3	B	805	NAG	C1-O5-C5	4.99	118.88	112.19
3	B	802	NAG	C4-C3-C2	4.73	117.94	111.02
3	D	804	NAG	C1-O5-C5	4.61	118.36	112.19
3	A	802	NAG	C1-O5-C5	4.51	118.23	112.19
4	A	800	7AC	C5-N4-C3	4.28	109.66	104.40
3	C	805	NAG	C1-O5-C5	4.23	117.86	112.19
4	D	800	7AC	C5-N4-C3	4.23	109.59	104.40
4	C	800	7AC	C10-C11-C16	-4.10	117.60	122.31
3	A	801	NAG	C1-O5-C5	3.98	117.52	112.19
4	C	800	7AC	C5-N4-C3	3.92	109.21	104.40
3	C	801	NAG	C4-C3-C2	3.80	116.58	111.02
4	B	800	7AC	C5-N4-C3	3.74	108.99	104.40
3	B	801	NAG	C1-O5-C5	3.05	116.27	112.19
4	A	800	7AC	N2-C3-N4	-2.81	110.32	114.27
4	D	800	7AC	N2-C3-N4	-2.78	110.36	114.27
3	C	804	NAG	C4-C3-C2	2.77	115.08	111.02
4	D	800	7AC	C12-C11-C10	2.76	125.45	118.42
4	C	800	7AC	N2-C3-N4	-2.74	110.42	114.27
3	A	801	NAG	O5-C5-C6	2.51	112.55	107.66
3	B	802	NAG	C2-N2-C7	2.48	126.23	122.90
3	A	803	NAG	C1-O5-C5	2.47	115.50	112.19
4	B	800	7AC	N2-C3-N4	-2.44	110.84	114.27
4	A	800	7AC	C12-C11-C10	2.40	124.53	118.42
3	A	806	NAG	O5-C5-C6	2.33	112.20	107.66
3	C	804	NAG	O5-C5-C6	2.32	112.19	107.66
4	B	800	7AC	C12-C11-C16	2.28	120.17	117.60
3	A	802	NAG	O5-C5-C6	2.25	112.04	107.66

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	C	804	NAG	C1

All (37) torsion outliers are listed below:

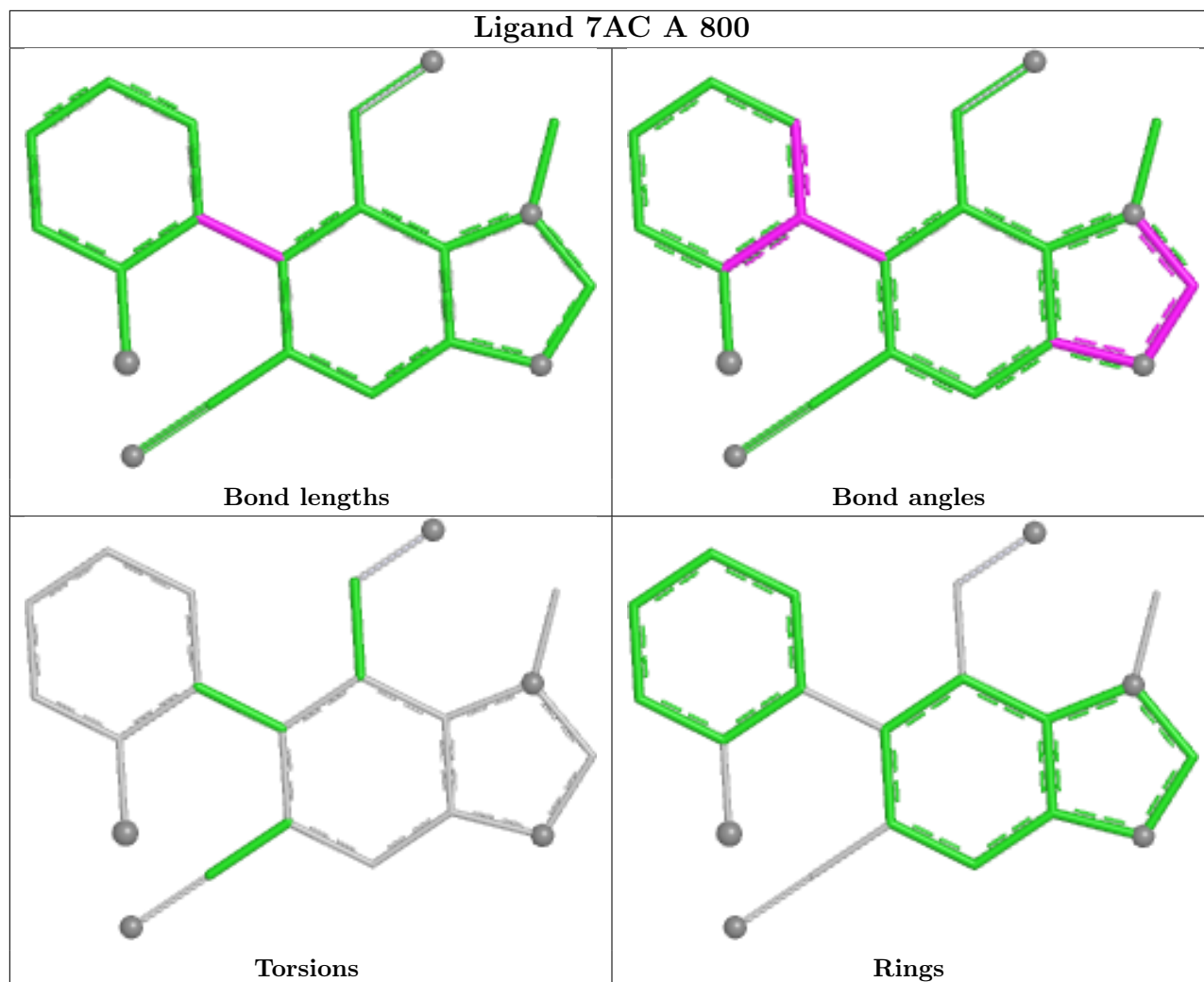
Mol	Chain	Res	Type	Atoms
3	A	801	NAG	C8-C7-N2-C2
3	A	801	NAG	O7-C7-N2-C2
3	A	803	NAG	C8-C7-N2-C2
3	A	803	NAG	O7-C7-N2-C2
3	B	801	NAG	C8-C7-N2-C2
3	B	801	NAG	O7-C7-N2-C2
3	B	802	NAG	C8-C7-N2-C2
3	B	802	NAG	O7-C7-N2-C2
3	C	801	NAG	C8-C7-N2-C2
3	C	801	NAG	O7-C7-N2-C2
3	C	804	NAG	C8-C7-N2-C2
3	C	804	NAG	O7-C7-N2-C2
3	D	804	NAG	C8-C7-N2-C2
3	D	804	NAG	O7-C7-N2-C2
3	B	802	NAG	C4-C5-C6-O6
3	D	804	NAG	C4-C5-C6-O6
3	B	801	NAG	O5-C5-C6-O6
3	D	804	NAG	O5-C5-C6-O6
3	A	802	NAG	O5-C5-C6-O6
3	A	802	NAG	C4-C5-C6-O6
3	B	802	NAG	O5-C5-C6-O6
3	B	801	NAG	C4-C5-C6-O6
3	A	801	NAG	O5-C5-C6-O6
3	A	806	NAG	O5-C5-C6-O6
3	D	801	NAG	O5-C5-C6-O6
3	B	805	NAG	C8-C7-N2-C2
3	C	801	NAG	C4-C5-C6-O6
3	C	801	NAG	O5-C5-C6-O6
3	A	801	NAG	C4-C5-C6-O6
3	B	805	NAG	O7-C7-N2-C2
3	C	805	NAG	C8-C7-N2-C2
3	D	801	NAG	C4-C5-C6-O6
3	C	805	NAG	O7-C7-N2-C2
3	A	806	NAG	C4-C5-C6-O6
3	B	805	NAG	C4-C5-C6-O6
3	B	802	NAG	C3-C2-N2-C7
3	B	805	NAG	O5-C5-C6-O6

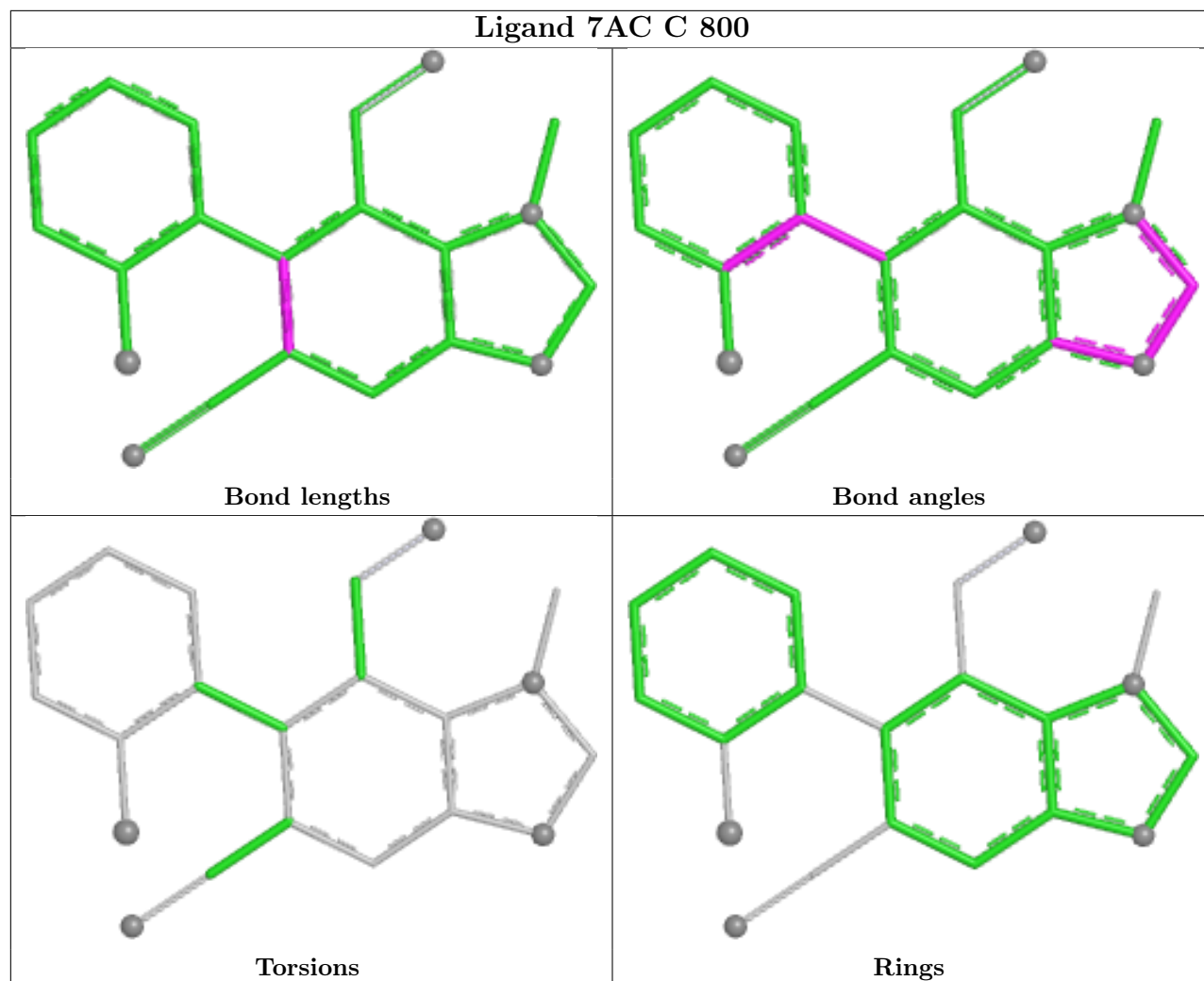
There are no ring outliers.

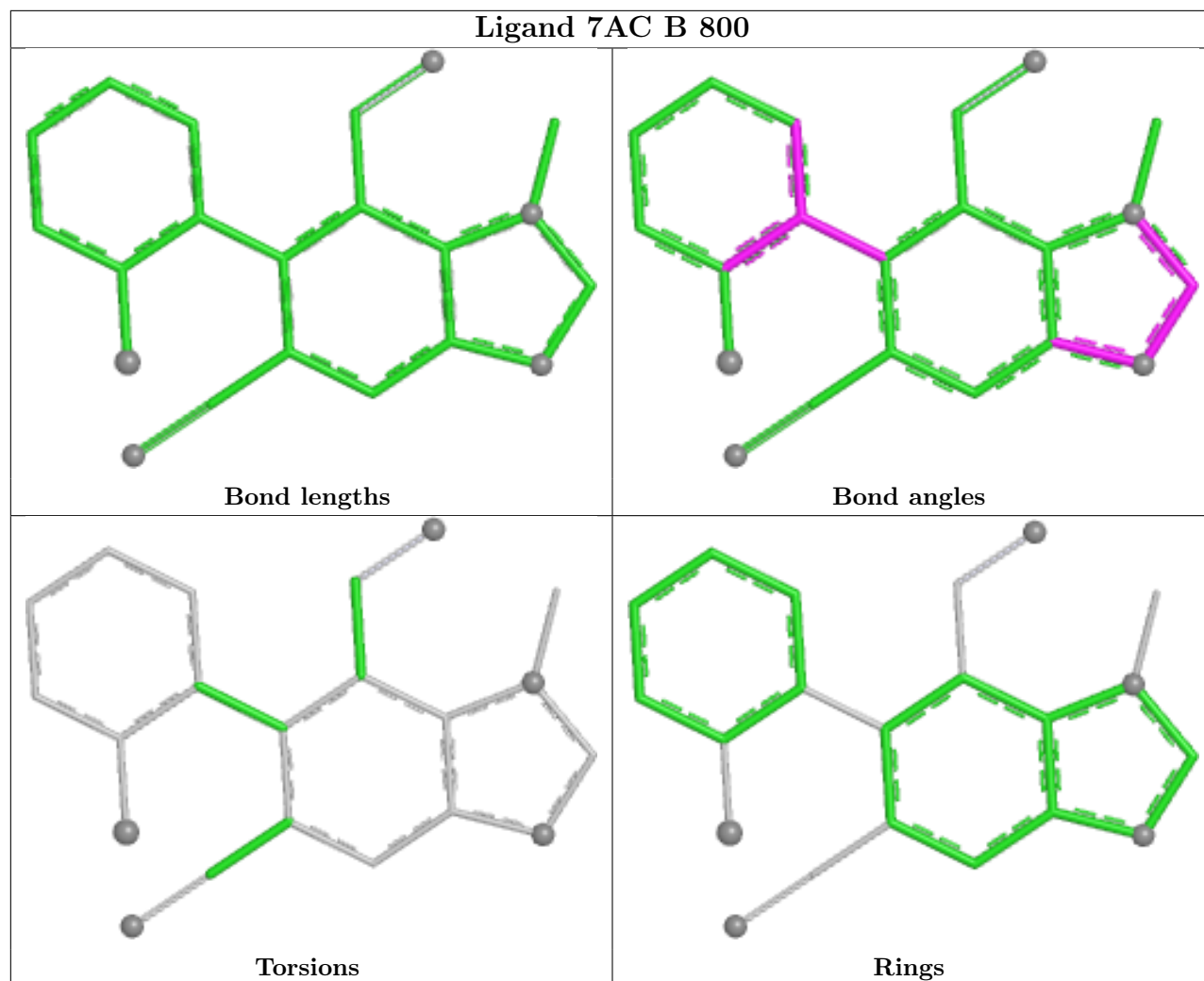
4 monomers are involved in 10 short contacts:

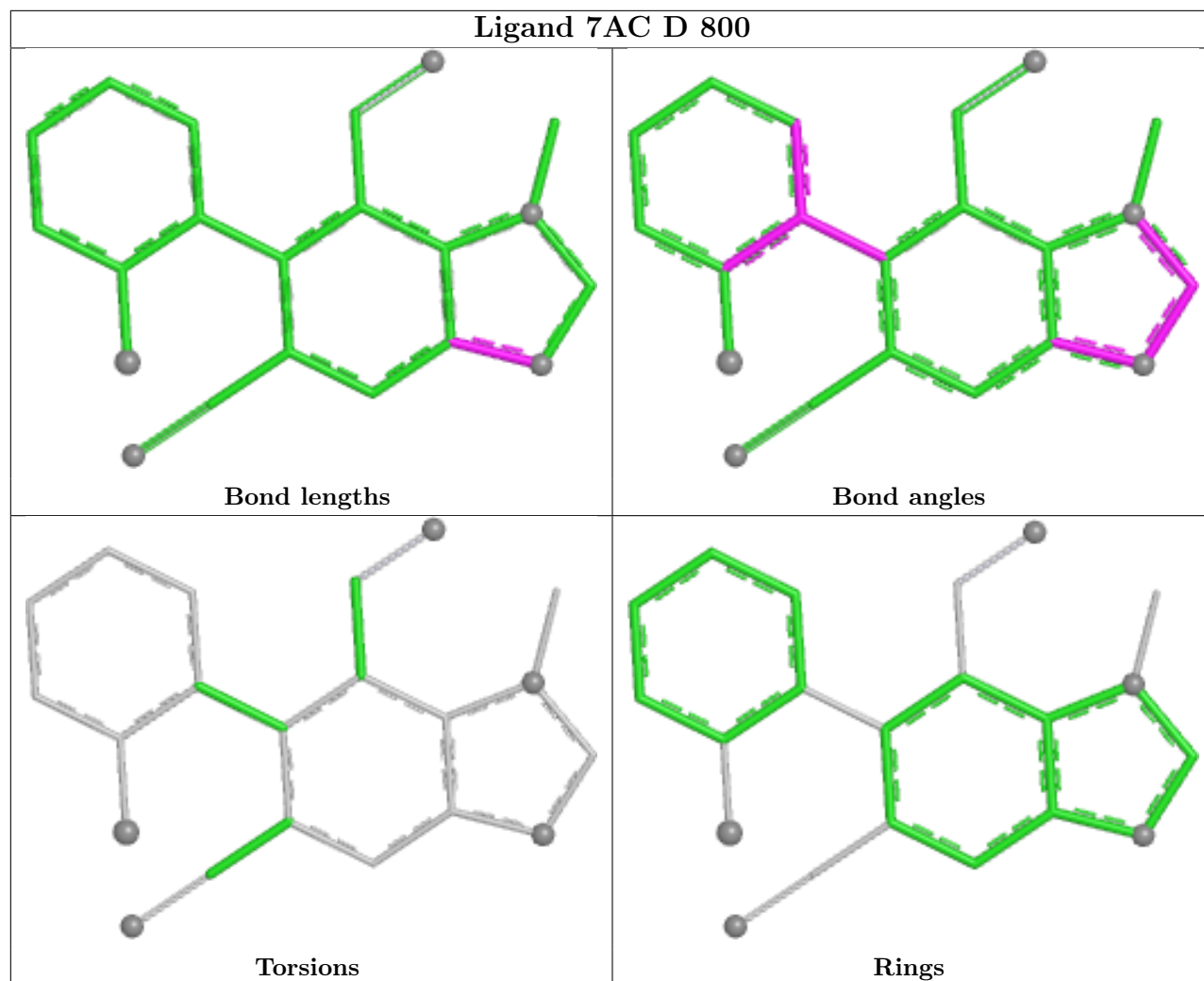
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	800	7AC	4	0
4	C	800	7AC	1	0
4	B	800	7AC	3	0
4	D	800	7AC	2	0

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	A	724/740 (97%)	0.11	4 (0%) 85 85	32, 52, 73, 108	0
1	B	724/740 (97%)	0.00	4 (0%) 85 85	28, 49, 75, 102	0
1	C	724/740 (97%)	0.32	21 (2%) 53 50	30, 57, 84, 99	0
1	D	724/740 (97%)	0.86	88 (12%) 8 8	40, 69, 95, 124	0
All	All	2896/2960 (97%)	0.32	117 (4%) 42 39	28, 55, 86, 124	0

All (117) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	220	GLY	4.1
1	C	143	ILE	4.0
1	D	63	ILE	3.9
1	D	384	ILE	3.9
1	D	102	ILE	3.7
1	D	322	TYR	3.7
1	D	385	CYS	3.5
1	D	90	LEU	3.4
1	C	490	GLY	3.4
1	C	88	VAL	3.4
1	D	372	TYR	3.3
1	D	69	LEU	3.3
1	D	375	ILE	3.3
1	D	415	LEU	3.3
1	D	306	ALA	3.3
1	D	388	GLN	3.2
1	D	176	ILE	3.2
1	B	148	ILE	3.2
1	D	395	THR	3.2
1	D	479	LEU	3.1
1	D	467	TYR	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	411	THR	3.1
1	D	373	LYS	3.0
1	A	95	PHE	3.0
1	D	601	PHE	2.9
1	D	292	SER	2.8
1	D	323	SER	2.8
1	D	397	ILE	2.8
1	D	394	CYS	2.8
1	D	164	LEU	2.8
1	C	90	LEU	2.8
1	D	339	CYS	2.8
1	C	142	LEU	2.8
1	B	137	LEU	2.7
1	C	491	LEU	2.7
1	D	380	GLY	2.7
1	C	152	THR	2.7
1	C	226	ALA	2.7
1	D	141	GLN	2.7
1	D	348	MET	2.7
1	D	387	PHE	2.7
1	C	137	LEU	2.7
1	D	142	LEU	2.7
1	D	389	ILE	2.6
1	D	162	HIS	2.6
1	A	72	GLN	2.6
1	C	330	TYR	2.6
1	C	145	GLU	2.6
1	D	167	VAL	2.6
1	D	327	ILE	2.6
1	D	276	LEU	2.6
1	C	89	PHE	2.6
1	D	222	PHE	2.6
1	D	291	ALA	2.5
1	D	324	VAL	2.5
1	D	330	TYR	2.5
1	D	113	PHE	2.5
1	D	468	TYR	2.5
1	D	78	VAL	2.5
1	C	176	ILE	2.4
1	D	214	LEU	2.4
1	D	376	SER	2.4
1	D	315	TRP	2.4

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Mol	Chain	Res	Type	RSRZ
1	D	305	TRP	2.4
1	D	223	LEU	2.4
1	D	374	ILE	2.4
1	B	274	ASP	2.4
1	D	95	PHE	2.4
1	D	134	ILE	2.3
1	D	62	TRP	2.3
1	D	434	ILE	2.3
1	D	273	THR	2.3
1	D	93	SER	2.3
1	D	486	VAL	2.3
1	D	491	LEU	2.3
1	D	88	VAL	2.3
1	D	137	LEU	2.3
1	C	102	ILE	2.3
1	D	386	TYR	2.3
1	D	321	ASN	2.3
1	D	149	PRO	2.3
1	D	159	PRO	2.2
1	C	282	ALA	2.2
1	D	148	ILE	2.2
1	A	94	THR	2.2
1	D	316	LEU	2.2
1	D	174	VAL	2.2
1	D	76	ILE	2.2
1	D	221	THR	2.2
1	D	301	CYS	2.2
1	D	427	GLY	2.2
1	C	270	VAL	2.2
1	C	149	PRO	2.2
1	B	399	LYS	2.2
1	D	482	LEU	2.2
1	C	144	THR	2.1
1	D	114	ILE	2.1
1	D	465	ALA	2.1
1	A	70	TYR	2.1
1	D	493	VAL	2.1
1	D	593	ALA	2.1
1	D	99	GLY	2.1
1	D	172	ILE	2.1
1	D	271	VAL	2.1
1	D	295	ILE	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	347	GLU	2.1
1	C	148	ILE	2.1
1	D	89	PHE	2.1
1	C	309	GLU	2.0
1	D	337	TRP	2.0
1	C	179	ASN	2.0
1	D	391	LYS	2.0
1	D	440	THR	2.0
1	D	673	LEU	2.0
1	D	279	VAL	2.0
1	D	83	TYR	2.0
1	D	414	TYR	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](#)

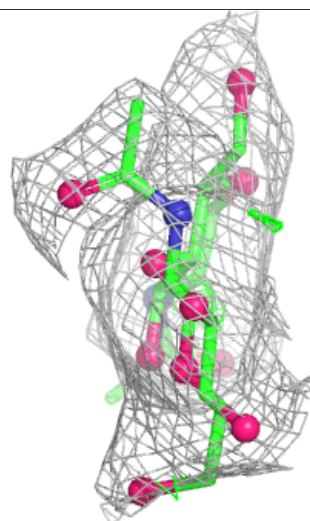
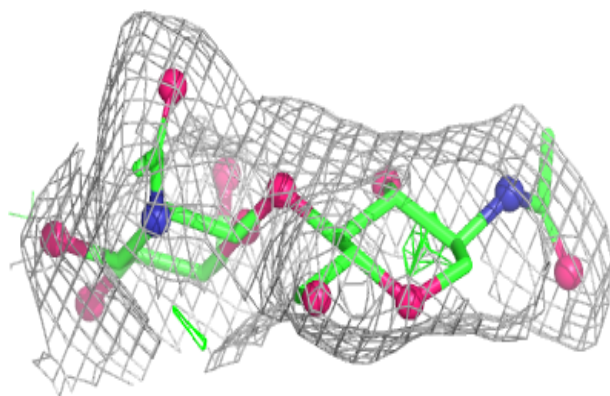
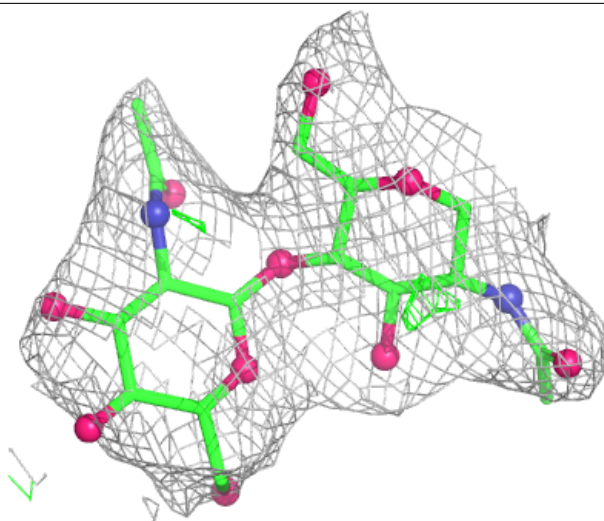
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	NAG	G	2	14/15	0.74	0.12	86,89,90,90	0
2	NAG	H	2	14/15	0.76	0.11	82,83,84,84	0
2	NAG	E	2	14/15	0.77	0.11	82,83,85,86	0
2	NAG	H	1	14/15	0.85	0.10	76,77,78,80	0
2	NAG	F	2	14/15	0.86	0.09	74,75,77,77	0
2	NAG	E	1	14/15	0.88	0.11	67,71,75,79	0
2	NAG	G	1	14/15	0.89	0.10	71,74,78,82	0
2	NAG	F	1	14/15	0.92	0.10	63,66,69,71	0

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.

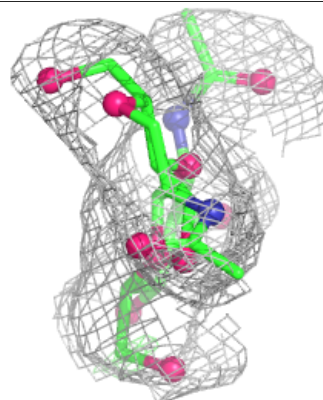
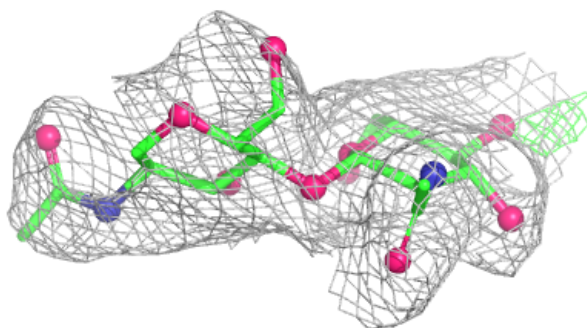
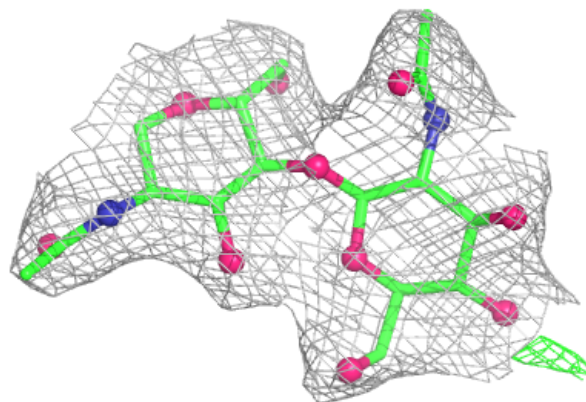
Electron density around Chain E:

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

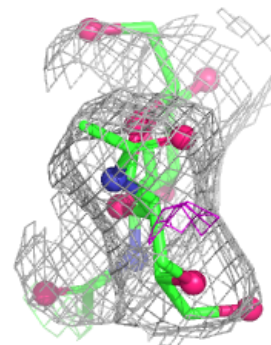
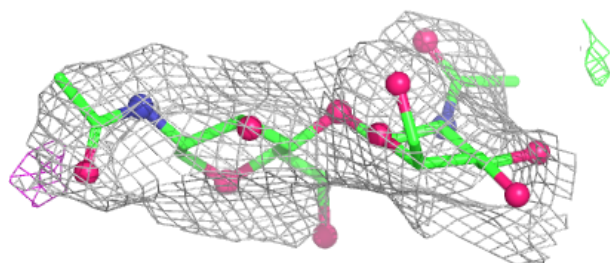
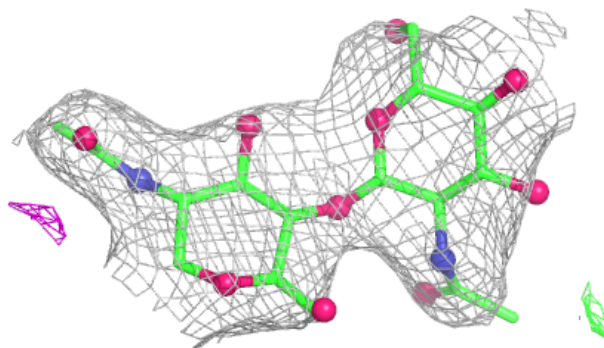


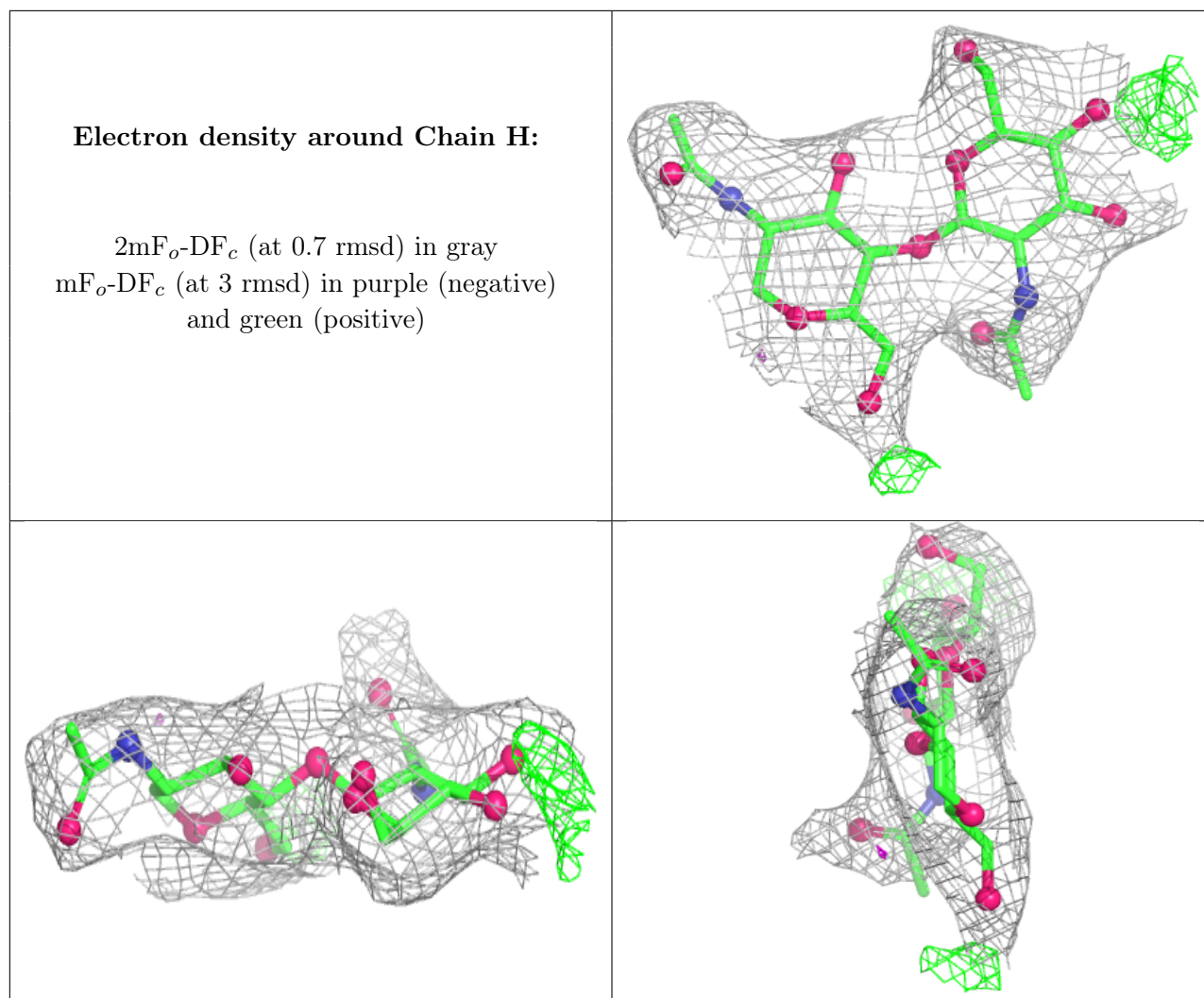
Electron density around Chain F:

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

**Electron density around Chain G:**

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





6.4 Ligands [i](#)

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.

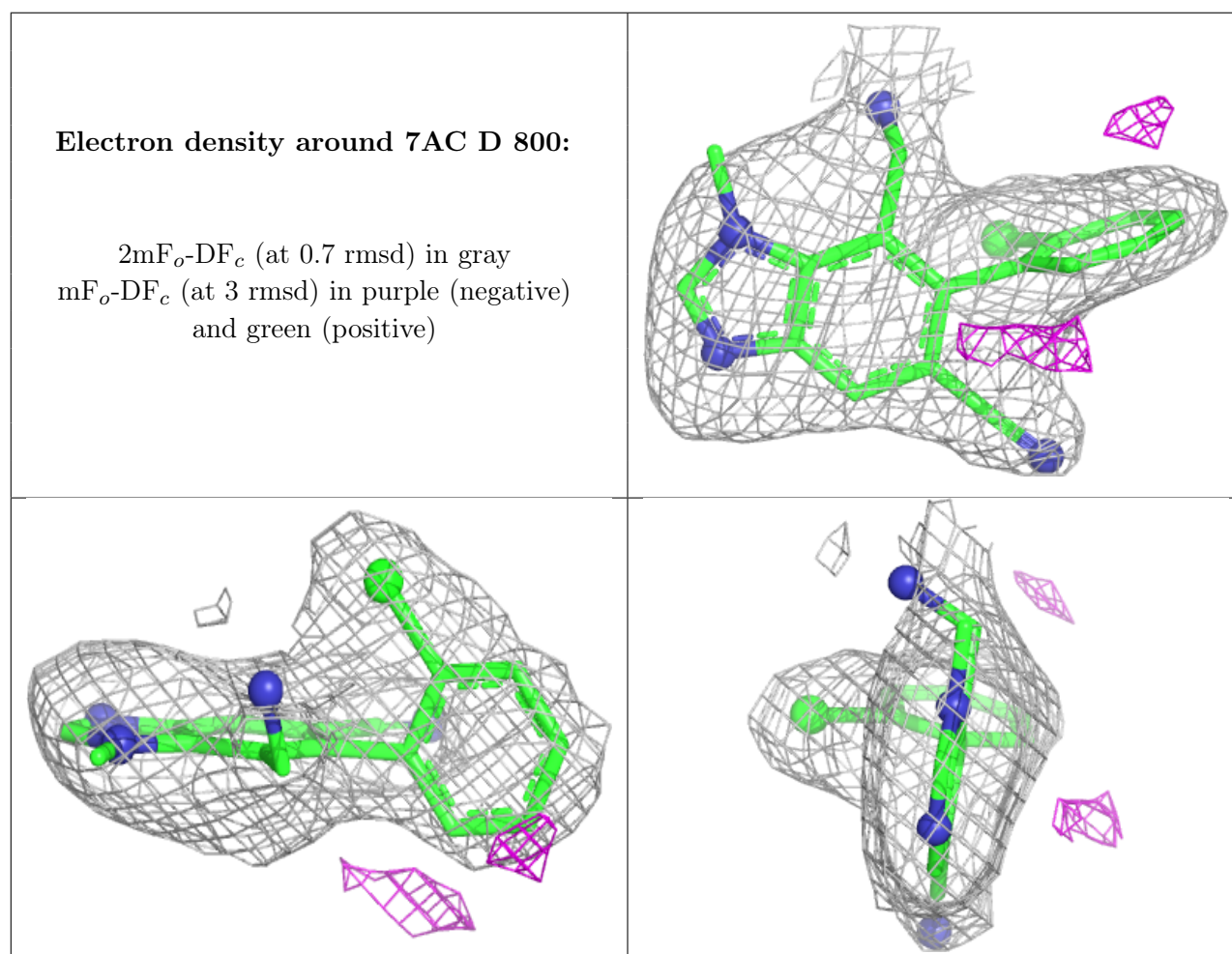
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	NAG	A	801	14/15	0.56	0.17	78,80,81,82	0
3	NAG	B	802	14/15	0.62	0.14	80,83,85,85	0
3	NAG	B	801	14/15	0.65	0.14	76,77,78,78	0
3	NAG	C	804	14/15	0.68	0.13	93,95,96,96	0
3	NAG	C	805	14/15	0.70	0.15	73,76,77,77	0
3	NAG	D	801	14/15	0.70	0.14	71,72,72,72	0
3	NAG	D	804	14/15	0.70	0.13	91,92,93,93	0
3	NAG	A	802	14/15	0.75	0.14	62,67,69,69	0
3	NAG	A	803	14/15	0.75	0.12	73,76,78,79	0

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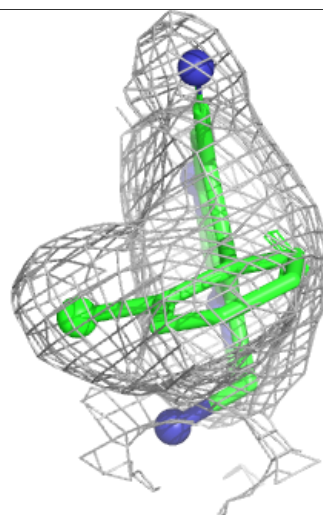
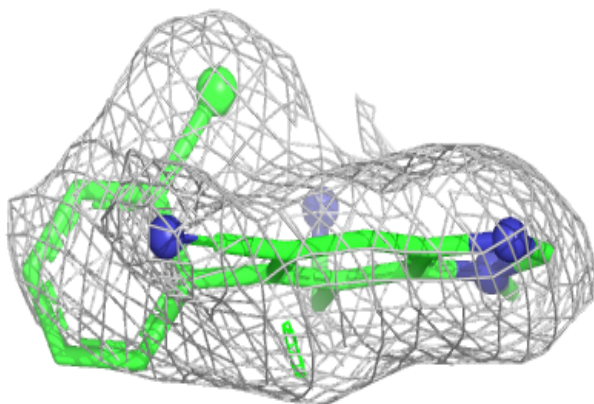
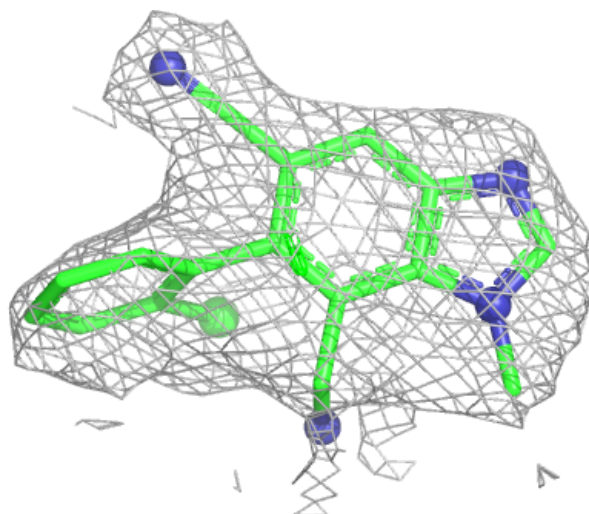
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	NAG	A	806	14/15	0.77	0.11	65,68,70,70	0
3	NAG	B	805	14/15	0.81	0.12	75,78,79,79	0
3	NAG	C	801	14/15	0.84	0.09	73,75,75,76	0
4	7AC	D	800	21/21	0.91	0.13	67,68,68,68	0
4	7AC	A	800	21/21	0.93	0.12	57,58,59,60	0
4	7AC	C	800	21/21	0.94	0.11	55,59,59,59	0
4	7AC	B	800	21/21	0.94	0.11	55,58,59,59	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.



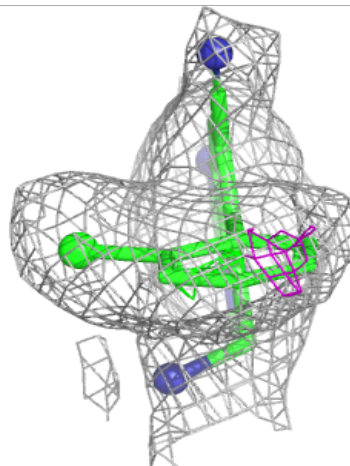
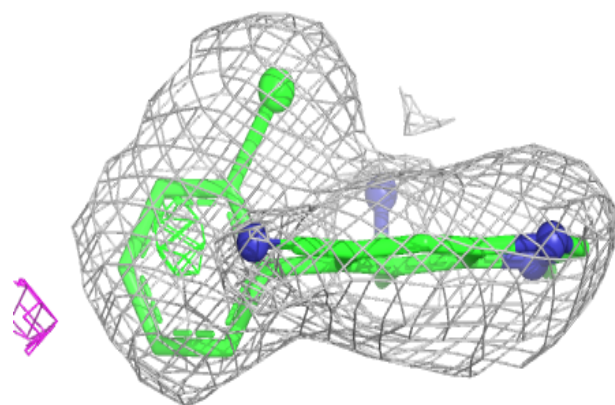
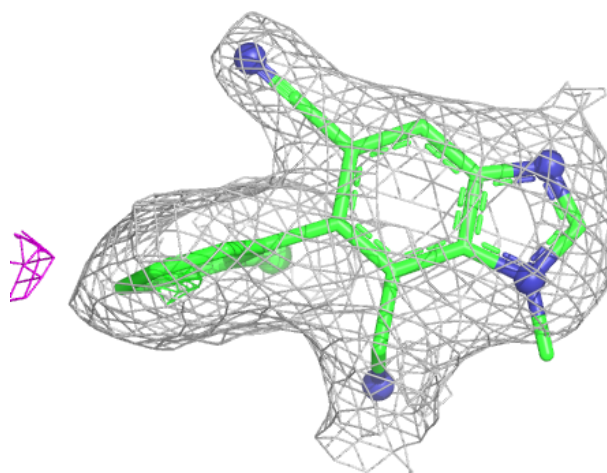
Electron density around 7AC A 800:

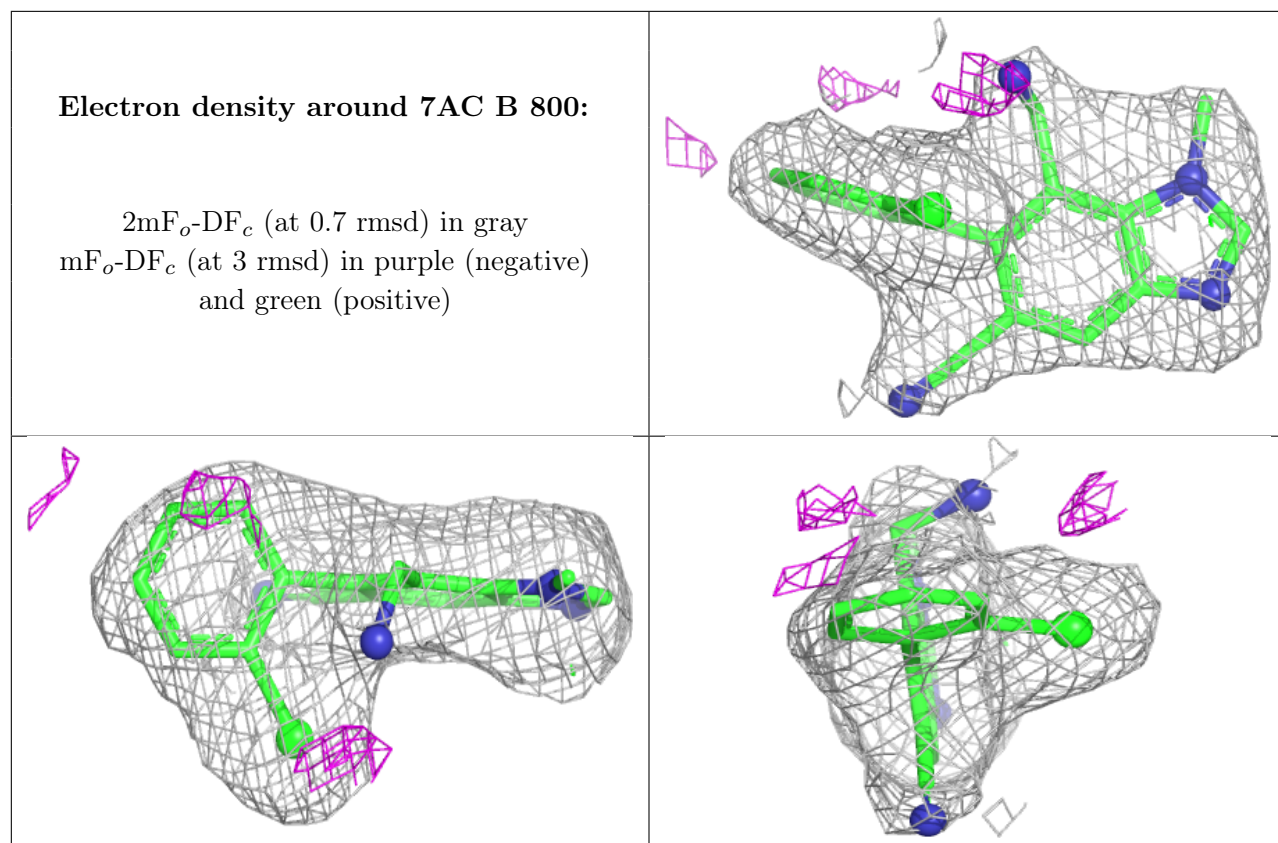
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around 7AC C 800:

$2mF_o-DF_c$ (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.