Full wwPDB X-ray Structure Validation Report ⓘ

Jan 18, 2022 – 09:28 pm GMT

PDB ID	:	7PFS
Title	:	Crystal structure of ERAP2 aminopeptidase in complex with phosphinic pseudotripeptide ((1R)-1-Amino-3-phenylpropyl){2-([1,1:3,1-terphenyl]-5-ylmethyl)-3-[((2S)-1-amino-1-oxo-3-phenylpropan-2-yl)-amino]-3-oxopropyl}phosphinic acid
Authors	:	Giastas, P.; Stratikos, E.; Mpakali, A.
Deposited on	:	2021-08-12
Resolution	:	2.70 Å(reported)

The following versions of software and data (see references ⓘ) were used in the production of this report:

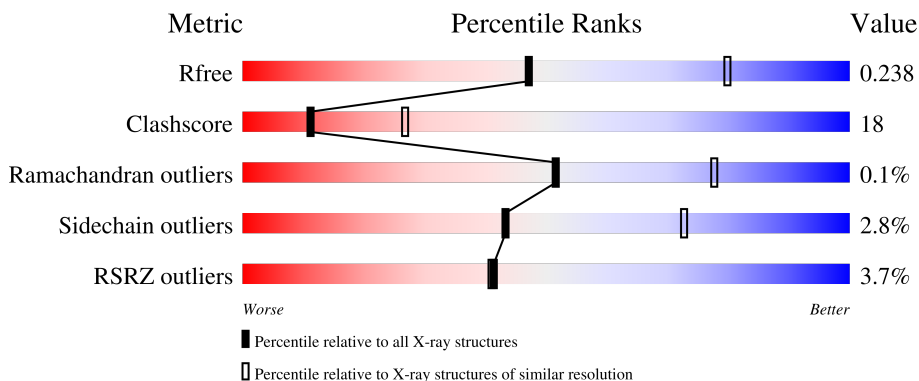|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.24
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.24

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 2.70 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.
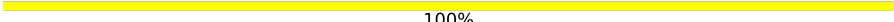
Metric	Percentile Ranks	Value
Rfree		0.238
Clashscore		18
Ramachandran outliers		0.1%
Sidechain outliers		2.8%
RSRZ outliers		3.7%

Worse   *Better*

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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 <=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	963	% 66% 28% • 5%
1	B	963	6% 55% 34% • 9%
2	C	3	33% 67%
2	D	3	33% 67%
2	E	3	67% 33%

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Mol	Chain	Length	Quality of chain
3	F	2	100%
3	H	2	50% 50%
3	I	2	100%
3	J	2	50% 50%
3	K	2	100%
4	G	5	40% 60%

2 Entry composition ⓘ

There are 10 unique types of molecules in this entry. The entry contains 14867 atoms, of which 88 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.
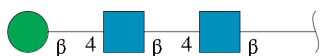
- Molecule 1 is a protein called Endoplasmic reticulum aminopeptidase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	916	Total 7360	C 4743	N 1224	O 1360	S 33	0	2	0
1	B	872	Total 6800	C 4399	N 1132	O 1243	S 26	0	1	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	392	ASN	LYS	variant	UNP Q6P179
A	961	ARG	-	expression tag	UNP Q6P179
A	962	HIS	-	expression tag	UNP Q6P179
A	963	HIS	-	expression tag	UNP Q6P179
B	392	ASN	LYS	variant	UNP Q6P179
B	961	ARG	-	expression tag	UNP Q6P179
B	962	HIS	-	expression tag	UNP Q6P179
B	963	HIS	-	expression tag	UNP Q6P179

- Molecule 2 is an oligosaccharide called 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
2	C	3	Total 39	C 22	N 2	O 15	0	0	0
2	D	3	Total 39	C 22	N 2	O 15	0	0	0
2	E	3	Total 39	C 22	N 2	O 15	0	0	0

- Molecule 3 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
3	F	2	Total 28	C 16	N 2	O 10	0	0	0
3	H	2	Total 28	C 16	N 2	O 10	0	0	0
3	I	2	Total 28	C 16	N 2	O 10	0	0	0
3	J	2	Total 28	C 16	N 2	O 10	0	0	0
3	K	2	Total 28	C 16	N 2	O 10	0	0	0

- Molecule 4 is an oligosaccharide called 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.

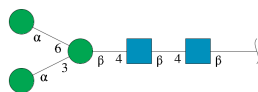| Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	G	5	Total 61	C 34	N 2	O 25	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

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

- Molecule 6 is [(2 {S})-3-[[(2 {S})-1-azanyl-4-methyl-1-oxidanylidene-pentan-2-yl]amino]-2 -[(3,5-diphenylphenyl)methyl]-3-oxidanylidene-propyl]-[(1 {R})-1-azanyl-3-phenyl-propy l]phosphinic acid (three-letter code: 7OO) (formula: $C_{37}H_{44}N_3O_4P$) (labeled as "Ligand of Interest" by depositor).
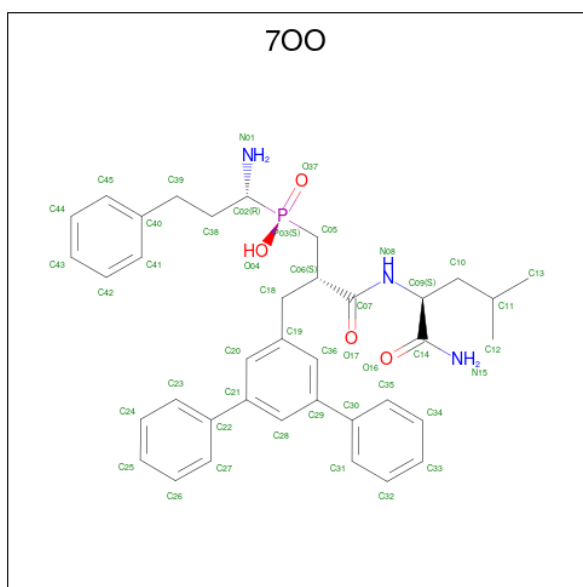
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
6	A	1	Total	C	H	N	O	P	0	0
			89	37	44	3	4	1		
6	B	1	Total	C	H	N	O	P	0	0
			89	37	44	3	4	1		

• Molecule 7 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			4	2	2		
7	A	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total 4	C 2	O 2	0	0

- Molecule 8 is IMIDAZOLE (three-letter code: IMD) (formula: $C_3H_5N_2$).

IMD
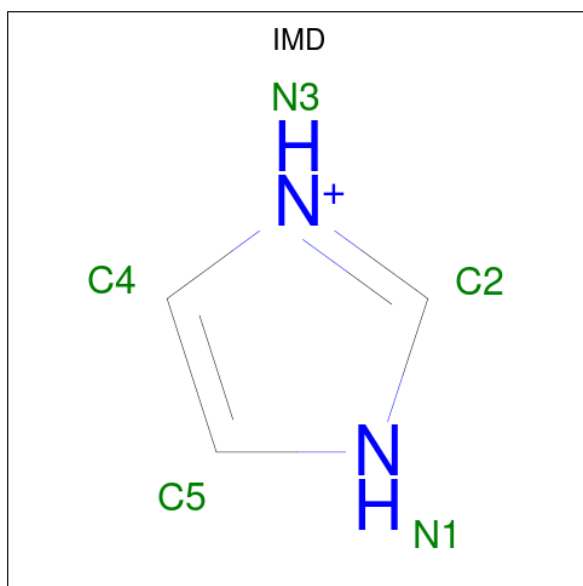
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total 5	C 3	N 2	0	0

- Molecule 9 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total 1	Zn 1	0	0
9	B	1	Total 1	Zn 1	0	0

- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	55	Total 55	O 55	0	0
10	B	25	Total 25	O 25	0	0

3 Residue-property plots ⓘ

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: Endoplasmic reticulum aminopeptidase 2
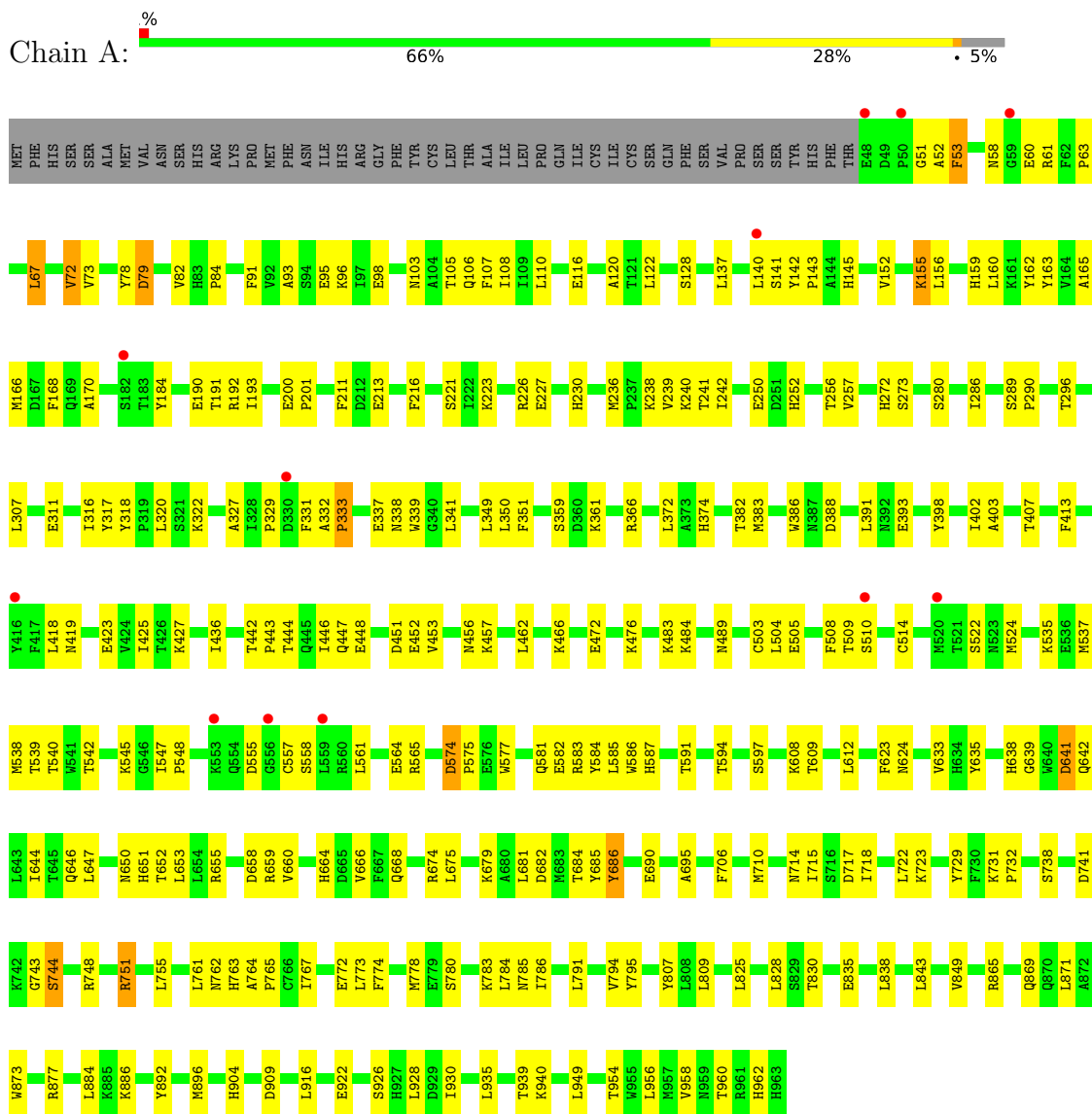
• Molecule 1: Endoplasmic reticulum aminopeptidase 2
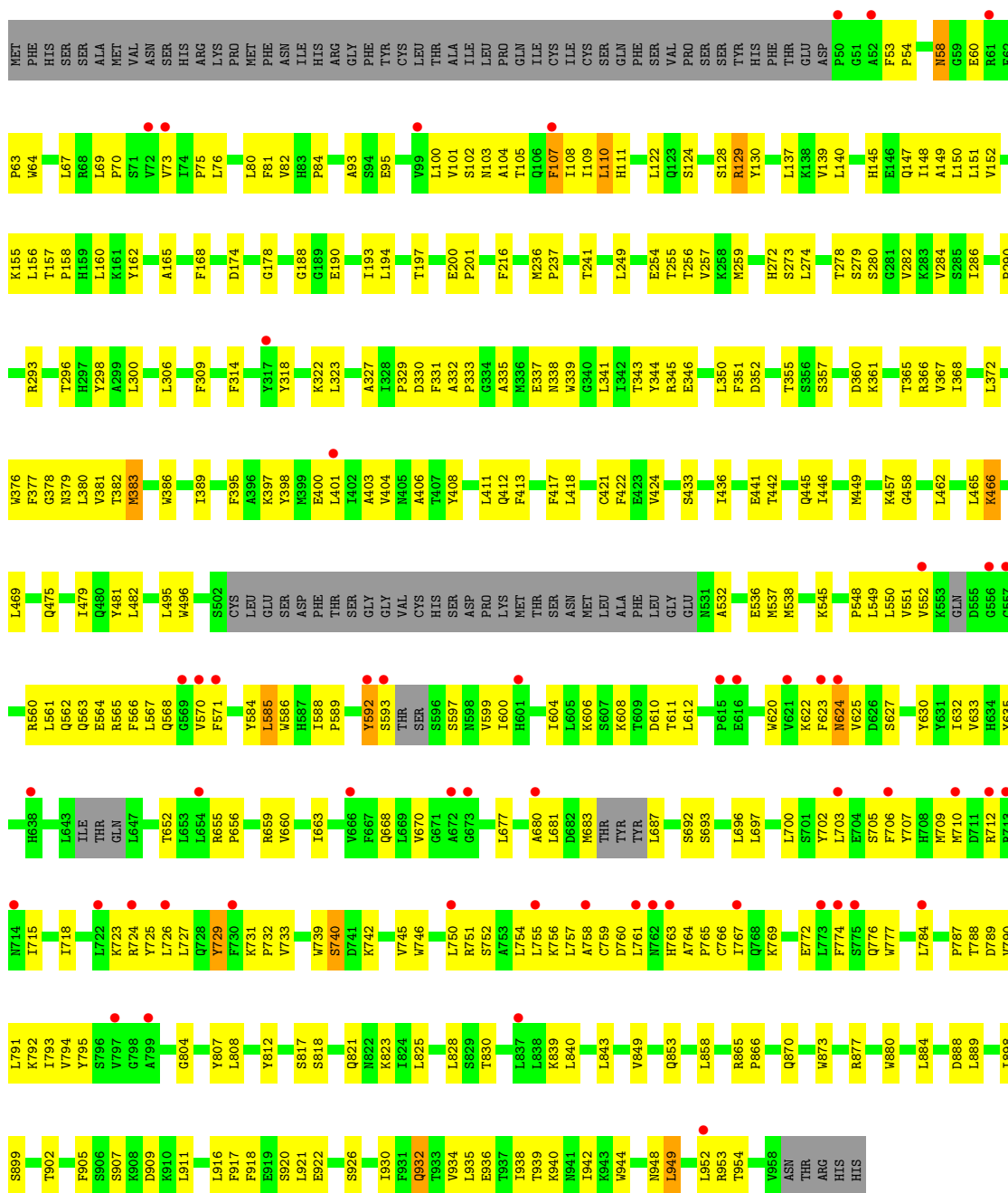
• Molecule 2: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-ac etamido-2-deoxy-beta-D-glucopyranose

• Molecule 2: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-ac etamido-2-deoxy-beta-D-glucopyranose

NAG1 NAG2 BMA3

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

Chain E: | 67% | 33% |

NAG1 NAG2 BMA3

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F: | 100% |

NAG1 NAG2

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H: | 50% | 50% |

NAG1 NAG2

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I: | 100% |

NAG1 NAG2

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J: | 50% | 50% |

NAG1 NAG2

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K: | 100% |

NAG1 NAG2

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

Chain G:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	75.14Å 133.82Å 128.70Å 90.00° 90.28° 90.00°	Depositor
Resolution (Å)	65.03 – 2.70 65.03 – 2.70	Depositor EDS
% Data completeness (in resolution range)	88.6 (65.03-2.70) 88.6 (65.03-2.70)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.61 (at 2.69Å)	Xtriage
Refinement program	PHENIX 1.14_3219, PHENIX 1.14_3219	Depositor
R, R_{free}	0.188 , 0.238 0.188 , 0.238	Depositor DCC
R_{free} test set	3101 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	65.4	Xtriage
Anisotropy	0.019	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.018 for -h,-l,-k 0.000 for -h,l,k 0.029 for h,-k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	14867	wwPDB-VP
Average B, all atoms (Å^2)	80.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.43% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: EDO, BMA, MAN, NAG, IMD, ZN, 7OO

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	0.58	3/7552 (0.0%)	0.76	8/10251 (0.1%)
1	B	0.55	4/6976 (0.1%)	0.71	5/9492 (0.1%)
All	All	0.56	7/14528 (0.0%)	0.74	13/19743 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	103	ASN	CG-ND2	-8.95	1.10	1.32
1	B	536	GLU	CD-OE1	-7.84	1.17	1.25
1	A	221	SER	CB-OG	-6.82	1.33	1.42
1	B	536	GLU	CD-OE2	-6.61	1.18	1.25
1	B	103	ASN	CG-OD1	-5.72	1.11	1.24
1	A	666	VAL	CB-CG1	-5.53	1.41	1.52
1	A	72	VAL	CB-CG2	-5.07	1.42	1.52

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	67	LEU	CB-CG-CD2	-19.86	77.24	111.00
1	A	67	LEU	CB-CG-CD1	-10.48	93.19	111.00
1	A	67	LEU	CD1-CG-CD2	9.84	140.02	110.50
1	B	536	GLU	OE1-CD-OE2	-8.54	113.06	123.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	949	LEU	CB-CG-CD2	-7.93	97.51	111.00
1	A	751	ARG	NE-CZ-NH1	-7.09	116.76	120.30
1	A	514	CYS	CA-CB-SG	-6.83	101.70	114.00
1	A	333	PRO	C-N-CA	-6.20	109.29	122.30
1	A	524	MET	CG-SD-CE	-5.79	90.94	100.20
1	B	953	ARG	NE-CZ-NH1	5.71	123.16	120.30
1	B	953	ARG	NE-CZ-NH2	-5.46	117.57	120.30
1	B	592	TYR	CA-CB-CG	5.21	123.31	113.40
1	A	155	LYS	CD-CE-NZ	5.20	123.66	111.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	684	THR	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	7360	0	7201	216	1
1	B	6800	0	6452	301	0
2	C	39	0	34	1	0
2	D	39	0	34	1	0
2	E	39	0	34	0	0
3	F	28	0	25	0	0
3	H	28	0	25	0	0
3	I	28	0	25	0	0
3	J	28	0	25	2	0
3	K	28	0	25	0	0
4	G	61	0	52	0	0
5	A	70	0	65	2	0
5	B	42	0	39	0	0
6	A	45	44	0	2	0
6	B	45	44	0	2	0
7	A	12	0	18	0	0
8	A	5	0	5	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	A	1	0	0	0	0
9	B	1	0	0	0	0
10	A	55	0	0	1	0
10	B	25	0	0	1	0
All	All	14779	88	14059	515	1

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 18.

All (515) 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:594:THR:HG23	1:A:597:SER:H	1.15	1.08
1:A:73:VAL:HG21	1:A:108:ILE:HD13	1.36	1.04
1:A:436:ILE:HD11	1:A:457:LYS:HG2	1.40	1.04
1:B:756:LYS:HA	1:B:793:ILE:HD11	1.37	1.03
1:B:917:PHE:HA	1:B:920:SER:HB3	1.38	1.02
1:A:53:PHE:H	1:A:61:ARG:NH2	1.59	1.01
1:B:622:LYS:HE3	1:B:624:ASN:O	1.59	1.01
1:A:784:LEU:HD13	1:A:785:ASN:N	1.76	1.00
1:A:52:ALA:HA	1:A:61:ARG:NH2	1.79	0.96
1:B:551:VAL:HB	1:B:562:GLN:HG2	1.48	0.95
1:B:408:TYR:HB3	1:B:411:LEU:HD12	1.47	0.94
1:A:53:PHE:H	1:A:61:ARG:HH21	1.18	0.88
1:B:592:TYR:HB3	1:B:623:PHE:HD1	1.40	0.85
1:B:140:LEU:HD11	1:B:151:LEU:HD11	1.60	0.84
1:B:563:GLN:HE22	1:B:586:TRP:H	1.26	0.82
1:B:105:THR:HG23	1:B:156:LEU:HD23	1.61	0.81
1:B:122:LEU:HB2	1:B:137:LEU:HD21	1.63	0.80
1:B:660:VAL:HA	1:B:663:ILE:HD12	1.62	0.80
1:A:594:THR:CG2	1:A:597:SER:H	1.93	0.79
1:B:939:THR:HA	1:B:942:ILE:HD12	1.62	0.79
1:A:53:PHE:N	1:A:61:ARG:NH2	2.31	0.78
1:B:592:TYR:HB3	1:B:623:PHE:CD1	2.18	0.77
1:A:660:VAL:HG12	1:A:695:ALA:HA	1.67	0.77
1:A:67:LEU:N	1:A:67:LEU:HD22	1.99	0.76
1:B:911:LEU:HD23	1:B:938:ILE:HB	1.65	0.76
1:B:568:GLN:HE22	1:B:668:GLN:HG3	1.49	0.76
1:B:622:LYS:HE3	1:B:624:ASN:C	2.06	0.75
1:B:715:ILE:CD1	1:B:718:ILE:HD12	2.17	0.75
1:B:715:ILE:HD13	1:B:718:ILE:HD12	1.69	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:VAL:HG11	1:A:108:ILE:CD1	2.18	0.74
1:B:739:TRP:HZ2	1:B:766:CYS:HB3	1.52	0.74
1:A:72:VAL:HG23	1:A:103:ASN:H	1.53	0.74
1:B:560:ARG:NH2	1:B:562:GLN:OE1	2.20	0.74
1:B:236:MET:HE2	1:B:254:GLU:HG2	1.70	0.73
1:A:236:MET:HG3	1:A:256:THR:HG22	1.70	0.73
1:A:337:GLU:HG3	1:A:374:HIS:HB3	1.70	0.73
1:B:759:CYS:HB3	1:B:767:ILE:HB	1.70	0.73
1:A:193:ILE:HG13	1:B:190:GLU:HG2	1.70	0.73
1:B:700:LEU:HD13	1:B:700:LEU:O	1.89	0.72
1:B:401:LEU:HD13	1:B:417:PHE:HB2	1.71	0.71
1:A:686:TYR:OH	1:A:690:GLU:OE1	2.05	0.71
1:B:361:LYS:O	1:B:365:THR:HG22	1.90	0.71
1:B:378:GLY:O	1:B:382:THR:HB	1.91	0.71
1:B:756:LYS:HA	1:B:793:ILE:CD1	2.16	0.71
1:B:411:LEU:HA	1:B:745:VAL:HG21	1.71	0.71
1:B:475:GLN:O	1:B:479:ILE:HG13	1.91	0.70
1:B:677:LEU:HD21	1:B:952:LEU:CD1	2.21	0.70
1:A:647:LEU:HD21	1:A:659:ARG:HG2	1.73	0.70
1:B:843:LEU:HD13	1:B:849:VAL:HG11	1.73	0.70
1:A:564:GLU:OE1	1:A:674:ARG:NH2	2.24	0.70
1:B:757:LEU:H	1:B:757:LEU:HD22	1.55	0.70
1:B:757:LEU:O	1:B:761:LEU:HG	1.92	0.70
1:A:741:ASP:HA	1:A:751:ARG:NH1	2.06	0.69
1:A:660:VAL:HG12	1:A:695:ALA:CA	2.23	0.69
1:B:566:PHE:O	1:B:567:LEU:HD23	1.93	0.69
1:A:388:ASP:HB3	1:A:391:LEU:HD12	1.75	0.68
1:B:104:ALA:HB1	1:B:155:LYS:HD3	1.75	0.68
1:B:787:PRO:HG2	1:B:790:VAL:CG2	2.23	0.68
1:A:594:THR:HG23	1:A:597:SER:N	2.00	0.68
1:A:52:ALA:HA	1:A:61:ARG:HH22	1.58	0.68
1:B:930:ILE:O	1:B:934:VAL:HG12	1.94	0.68
1:B:552:VAL:HG22	1:B:635:TYR:HA	1.76	0.67
1:A:780:SER:O	1:A:783:LYS:HB2	1.94	0.67
1:A:52:ALA:CA	1:A:61:ARG:NH2	2.58	0.67
1:A:366:ARG:HD2	1:A:413:PHE:CZ	2.30	0.66
1:B:75:PRO:HD2	1:B:216:PHE:HD2	1.61	0.66
1:B:700:LEU:HD13	1:B:700:LEU:C	2.15	0.66
1:B:703:LEU:HD13	1:B:726:LEU:HD21	1.77	0.66
1:B:549:LEU:HB2	1:B:566:PHE:HB2	1.78	0.66
1:B:952:LEU:O	1:B:952:LEU:HG	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:622:LYS:NZ	1:B:624:ASN:N	2.45	0.65
1:A:327:ALA:HB2	1:A:349:LEU:HD23	1.80	0.64
1:B:902:THR:OG1	1:B:934:VAL:HG21	1.97	0.64
1:B:697:LEU:HD21	1:B:750:LEU:HD13	1.79	0.64
1:B:357:SER:HA	1:B:788:THR:CG2	2.28	0.64
1:B:752:SER:HB3	1:B:789:ASP:O	1.97	0.64
1:A:236:MET:SD	1:A:256:THR:HA	2.37	0.64
1:B:351:PHE:CZ	1:B:361:LYS:HE2	2.33	0.64
1:A:286:ILE:HG21	1:A:296:THR:HB	1.79	0.63
1:B:918:PHE:O	1:B:922:GLU:HG3	1.98	0.63
1:A:82:VAL:HG12	1:A:84:PRO:HD3	1.81	0.63
1:B:76:LEU:HD11	1:B:100:LEU:HB2	1.79	0.63
1:B:421:CYS:O	1:B:424:VAL:HG12	1.98	0.63
1:B:152:VAL:HG21	1:B:156:LEU:HD22	1.81	0.63
1:B:272:HIS:CE1	1:B:290:PRO:HB3	2.34	0.63
1:B:723:LYS:O	1:B:727:LEU:HD12	1.98	0.63
1:B:656:PRO:O	1:B:659:ARG:HB2	1.99	0.63
1:B:140:LEU:HD12	1:B:151:LEU:HD21	1.81	0.62
1:A:386:TRP:CD1	1:A:446:ILE:HD13	2.34	0.62
1:B:563:GLN:NE2	1:B:585:LEU:HA	2.15	0.62
1:A:272:HIS:CE1	1:A:290:PRO:HB3	2.34	0.62
1:A:892:TYR:HB2	6:A:1006:7OO:C12	2.30	0.61
1:A:784:LEU:HD13	1:A:785:ASN:H	1.63	0.61
1:A:257:VAL:HB	2:C:1:NAG:H61	1.80	0.61
1:A:873:TRP:CZ2	1:A:877:ARG:HD3	2.35	0.61
1:A:51:GLY:O	1:A:61:ARG:HD3	2.00	0.61
1:B:622:LYS:HZ1	1:B:624:ASN:CB	2.14	0.61
1:B:677:LEU:HD21	1:B:952:LEU:HD13	1.82	0.61
1:B:898:ILE:HD11	1:B:930:ILE:HG21	1.82	0.61
1:B:424:VAL:HG21	1:B:457:LYS:HB2	1.83	0.61
1:B:911:LEU:CD2	1:B:938:ILE:HB	2.31	0.61
1:B:400:GLU:O	1:B:404:VAL:HG12	2.01	0.60
1:A:786:ILE:HD13	1:A:794:VAL:HG11	1.82	0.60
1:A:78:TYR:OH	10:A:1101:HOH:O	2.15	0.60
1:A:935:LEU:O	1:A:939:THR:HG23	2.01	0.60
1:A:58:ASN:OD1	1:A:60:GLU:HB2	2.02	0.60
1:A:537:MET:O	1:A:540:THR:HG22	2.01	0.60
1:A:442:THR:O	1:A:446:ILE:HG13	2.01	0.59
1:A:52:ALA:HA	1:A:61:ARG:CZ	2.31	0.59
1:A:916:LEU:HD23	1:A:916:LEU:O	2.02	0.59
1:B:774:PHE:HE2	1:B:795:TYR:HA	1.68	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:139:VAL:HG22	1:B:150:LEU:HD22	1.84	0.59
1:B:739:TRP:CZ2	1:B:766:CYS:HB3	2.35	0.59
1:B:932:GLN:O	1:B:936:GLU:HG3	2.02	0.59
1:B:122:LEU:N	1:B:137:LEU:HD11	2.18	0.58
1:B:58:ASN:HD21	1:B:140:LEU:HD23	1.68	0.58
1:B:73:VAL:HG11	1:B:108:ILE:HG23	1.84	0.58
1:A:236:MET:CE	1:A:320:LEU:HD22	2.34	0.58
1:A:641:ASP:HA	1:A:644:ILE:HG13	1.84	0.58
1:A:311:GLU:HG2	1:A:317:TYR:HA	1.83	0.58
1:A:366:ARG:HD2	1:A:413:PHE:CE1	2.38	0.58
1:A:443:PRO:O	1:A:447:GLN:HG2	2.04	0.58
1:B:563:GLN:HE22	1:B:585:LEU:HA	1.68	0.58
1:A:545:LYS:HE3	1:A:565:ARG:NH2	2.19	0.58
1:B:412:GLN:OE1	1:B:746:TRP:HB2	2.03	0.58
1:B:69:LEU:HD22	1:B:109:ILE:HG22	1.85	0.57
1:A:238:LYS:HD2	1:A:241:THR:OG1	2.04	0.57
1:A:718:ILE:CD1	1:A:949:LEU:HD11	2.34	0.57
1:A:778:MET:HG3	1:A:807:TYR:CD2	2.39	0.57
1:B:592:TYR:O	1:B:600:ILE:HA	2.03	0.57
1:A:351:PHE:CE1	1:A:361:LYS:HD3	2.39	0.57
1:B:727:LEU:HD22	1:B:763:HIS:CG	2.40	0.57
1:A:685:TYR:O	1:A:686:TYR:HB3	2.03	0.57
1:A:647:LEU:HD22	1:A:686:TYR:CZ	2.40	0.57
1:B:622:LYS:HZ2	1:B:624:ASN:N	2.02	0.57
1:B:917:PHE:CA	1:B:920:SER:HB3	2.25	0.57
1:B:949:LEU:HD22	1:B:949:LEU:O	2.05	0.56
1:B:563:GLN:HE22	1:B:586:TRP:N	2.00	0.56
1:A:73:VAL:CG2	1:A:108:ILE:HD13	2.25	0.56
1:A:398:TYR:OH	1:A:466:LYS:HD3	2.06	0.56
1:B:58:ASN:HD21	1:B:140:LEU:CD2	2.19	0.56
1:B:395:PHE:CD2	1:B:462:LEU:HD11	2.40	0.56
1:A:105:THR:HG22	1:A:107:PHE:H	1.70	0.56
1:A:307:LEU:HD13	1:A:372:LEU:HD13	1.87	0.56
1:A:122:LEU:HD11	1:A:162:TYR:HB3	1.87	0.56
1:B:418:LEU:HG	1:B:422:PHE:CZ	2.41	0.56
1:B:344:TYR:HE2	1:B:367:VAL:HG12	1.71	0.56
1:A:53:PHE:N	1:A:61:ARG:HH22	2.04	0.56
1:A:548:PRO:HB3	1:A:586:TRP:CE3	2.41	0.56
1:B:76:LEU:HD11	1:B:100:LEU:CB	2.36	0.56
1:B:683:MET:O	1:B:687:LEU:N	2.39	0.56
1:B:593:SER:HB2	1:B:599:VAL:O	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:659:ARG:O	1:B:663:ILE:HG13	2.06	0.55
1:B:777:TRP:HB2	1:B:784:LEU:HD23	1.88	0.55
1:A:472:GLU:O	1:A:476:LYS:HG3	2.06	0.55
1:B:787:PRO:HG2	1:B:790:VAL:HG21	1.88	0.55
1:A:67:LEU:HD11	1:A:145:HIS:HA	1.88	0.55
1:B:907:SER:OG	1:B:909:ASP:HB3	2.06	0.55
1:A:106:GLN:HG2	1:A:155:LYS:HE2	1.89	0.55
1:B:58:ASN:OD1	1:B:60:GLU:HG3	2.07	0.55
1:B:764:ALA:HA	1:B:767:ILE:CG2	2.37	0.55
1:A:159:HIS:O	1:A:160:LEU:HD23	2.05	0.55
1:A:582:GLU:O	1:A:584:TYR:N	2.39	0.55
1:A:723:LYS:HG3	1:A:761:LEU:HB3	1.88	0.55
1:B:357:SER:HB2	1:B:360:ASP:H	1.72	0.55
1:B:548:PRO:HB2	1:B:588:ILE:HD11	1.89	0.55
1:A:715:ILE:HG21	1:A:718:ILE:HD12	1.88	0.55
1:B:298:TYR:OH	1:B:365:THR:HB	2.06	0.55
1:A:286:ILE:CG2	1:A:296:THR:HB	2.36	0.54
1:B:681:LEU:HD21	1:B:952:LEU:HD11	1.88	0.54
1:B:278:THR:CG2	1:B:282:VAL:HB	2.38	0.54
1:B:764:ALA:HA	1:B:767:ILE:HG23	1.89	0.54
1:B:398:TYR:OH	1:B:466:LYS:HE2	2.07	0.54
1:A:190:GLU:CG	1:B:193:ILE:HG13	2.37	0.54
1:B:604:ILE:HG21	1:B:606:LYS:HE2	1.89	0.54
1:B:830:THR:HG22	1:B:865:ARG:HH21	1.73	0.54
1:B:905:PHE:O	1:B:938:ILE:HG23	2.08	0.54
1:B:241:THR:HG21	1:B:249:LEU:HD23	1.88	0.54
1:A:555:ASP:HB3	1:A:558:SER:OG	2.08	0.54
1:A:538:MET:O	1:A:542:THR:HG23	2.07	0.54
1:B:703:LEU:CD1	1:B:726:LEU:HD21	2.36	0.53
1:A:184:TYR:CE1	1:A:192:ARG:HB2	2.43	0.53
1:A:472:GLU:HG3	1:A:504:LEU:CD1	2.38	0.53
1:B:750:LEU:HD12	1:B:750:LEU:O	2.07	0.53
1:B:898:ILE:HD11	1:B:930:ILE:CG2	2.37	0.53
1:B:724:ARG:HA	1:B:727:LEU:HD12	1.89	0.53
1:B:884:LEU:O	1:B:884:LEU:HD23	2.08	0.53
1:A:646:GLN:NE2	1:A:653:LEU:HD12	2.22	0.53
1:B:174:ASP:OD1	1:B:174:ASP:N	2.40	0.53
1:A:718:ILE:HD13	1:A:949:LEU:HD11	1.91	0.53
1:A:393:GLU:OE1	6:A:1006:7OO:N01	2.41	0.53
1:B:622:LYS:NZ	1:B:624:ASN:H	2.06	0.53
1:A:623:PHE:HB2	1:A:633:VAL:HG21	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:641:ASP:HA	1:A:644:ILE:CG1	2.39	0.53
1:A:647:LEU:HD23	1:A:651:HIS:HB2	1.90	0.53
1:A:51:GLY:O	1:A:61:ARG:NH2	2.43	0.53
1:B:389:ILE:HG21	1:B:449:MET:HB3	1.90	0.52
1:B:101:VAL:HG12	1:B:160:LEU:O	2.10	0.52
1:B:727:LEU:HD22	1:B:763:HIS:CD2	2.44	0.52
1:A:956:LEU:O	1:A:960:THR:HG23	2.10	0.52
1:B:376:TRP:HA	1:B:380:LEU:HB2	1.92	0.52
1:B:772:GLU:O	1:B:776:GLN:HG3	2.09	0.52
1:B:880:TRP:CZ2	1:B:884:LEU:HD12	2.44	0.52
1:B:465:LEU:CD1	1:B:469:LEU:HD12	2.39	0.52
1:B:670:VAL:HG13	1:B:948:ASN:HD21	1.74	0.52
1:B:677:LEU:HA	1:B:680:ALA:HB2	1.91	0.52
1:B:700:LEU:HD22	1:B:703:LEU:HB2	1.91	0.52
1:B:755:LEU:HA	1:B:758:ALA:HB3	1.92	0.52
1:B:944:TRP:O	1:B:948:ASN:HB3	2.10	0.52
1:A:738:SER:O	1:A:751:ARG:HD3	2.10	0.52
1:A:928:LEU:HB3	1:A:930:ILE:HG22	1.91	0.52
1:B:818:SER:HA	1:B:821:GLN:HG2	1.91	0.52
1:B:710:MET:HE1	1:B:718:ILE:HG22	1.92	0.52
1:B:282:VAL:HG21	1:B:318:TYR:HD2	1.75	0.52
1:B:386:TRP:CD1	1:B:446:ILE:HD13	2.44	0.51
1:A:141:SER:OG	1:A:143:PRO:HD3	2.10	0.51
1:A:743:GLY:H	1:A:751:ARG:HH22	1.58	0.51
1:B:397:LYS:O	1:B:400:GLU:HG2	2.11	0.51
1:A:61:ARG:HH21	1:A:61:ARG:HG2	1.74	0.51
1:A:809:LEU:HD13	1:A:828:LEU:HD13	1.92	0.51
1:B:241:THR:CG2	1:B:249:LEU:HD23	2.41	0.51
1:B:677:LEU:HD21	1:B:952:LEU:HD12	1.93	0.51
1:B:378:GLY:N	1:B:381:VAL:O	2.44	0.51
1:A:184:TYR:CE2	1:A:289:SER:HB2	2.46	0.51
1:A:635:TYR:HB3	1:A:639:GLY:HA3	1.92	0.51
1:B:873:TRP:CZ2	1:B:877:ARG:HD3	2.46	0.51
1:B:921:LEU:O	1:B:926:SER:HB2	2.11	0.51
1:A:928:LEU:CB	1:A:930:ILE:HG22	2.41	0.51
5:A:1003:NAG:O7	5:A:1003:NAG:O3	2.29	0.51
1:B:124:SER:N	1:B:130:TYR:O	2.44	0.51
1:B:256:THR:HG21	1:B:259:MET:SD	2.51	0.51
1:B:465:LEU:HD11	1:B:469:LEU:HD12	1.91	0.51
1:A:843:LEU:HD22	1:A:849:VAL:HG22	1.93	0.50
1:B:102:SER:O	1:B:158:PRO:HB3	2.10	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:585:LEU:CD1	1:A:608:LYS:HB2	2.41	0.50
1:B:338:ASN:HB2	1:B:341:LEU:O	2.11	0.50
1:A:869:GLN:HG3	1:A:904:HIS:HE1	1.76	0.50
1:B:337:GLU:HG2	6:B:2301:7OO:N01	2.26	0.50
1:B:330:ASP:OD1	1:B:853:GLN:HB3	2.11	0.50
1:B:917:PHE:O	1:B:921:LEU:HG	2.11	0.50
1:B:934:VAL:O	1:B:938:ILE:HD12	2.11	0.50
1:B:366:ARG:HD2	1:B:413:PHE:CZ	2.47	0.50
1:A:273:SER:HA	1:A:286:ILE:O	2.11	0.50
1:A:869:GLN:HG3	1:A:904:HIS:CE1	2.46	0.50
1:B:306:LEU:HD13	1:B:368:ILE:O	2.11	0.50
1:B:774:PHE:HD2	1:B:794:VAL:HG12	1.77	0.50
1:A:674:ARG:O	1:A:675:LEU:HD12	2.11	0.50
1:B:63:PRO:HB2	1:B:107:PHE:CD2	2.47	0.50
1:B:139:VAL:HG22	1:B:150:LEU:CD2	2.42	0.50
1:B:563:GLN:NE2	1:B:586:TRP:H	2.04	0.50
1:B:932:GLN:OE1	1:B:935:LEU:HD12	2.11	0.50
1:B:561:LEU:HB2	1:B:610:ASP:O	2.11	0.50
1:A:647:LEU:HD22	1:A:686:TYR:CE2	2.47	0.49
1:A:419:ASN:O	1:A:423:GLU:HG3	2.12	0.49
1:A:537:MET:HG3	1:A:587:HIS:HB2	1.95	0.49
1:B:332:ALA:HB3	1:B:333:PRO:HD3	1.94	0.49
1:B:625:VAL:HG13	1:B:655:ARG:HH22	1.75	0.49
1:B:755:LEU:HA	1:B:758:ALA:CB	2.42	0.49
1:B:352:ASP:HB3	1:B:355:THR:OG1	2.12	0.49
1:B:733:VAL:HG22	1:B:754:LEU:HD21	1.94	0.49
1:A:91:PHE:CE1	1:A:170:ALA:HB3	2.48	0.49
1:B:404:VAL:HG11	1:B:413:PHE:CD2	2.48	0.49
1:B:562:GLN:HA	1:B:608:LYS:O	2.13	0.49
1:A:791:LEU:HD11	1:A:795:TYR:CZ	2.48	0.49
1:B:109:ILE:HD13	1:B:149:ALA:HA	1.94	0.49
1:A:762:ASN:HA	1:A:767:ILE:CD1	2.42	0.49
1:A:715:ILE:CG2	1:A:718:ILE:HD12	2.43	0.49
1:B:442:THR:OG1	1:B:445:GLN:HB3	2.13	0.49
1:B:152:VAL:HG21	1:B:156:LEU:CD2	2.43	0.49
1:B:551:VAL:HB	1:B:562:GLN:CG	2.33	0.48
1:B:604:ILE:HG22	1:B:606:LYS:HG2	1.95	0.48
1:B:314:PHE:CD1	1:B:482:LEU:HD11	2.48	0.48
1:B:566:PHE:CD2	1:B:632:ILE:HD13	2.49	0.48
1:B:597:SER:O	1:B:599:VAL:N	2.46	0.48
1:B:812:TYR:HE2	1:B:825:LEU:HB2	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:190:GLU:HG3	1:B:193:ILE:HG13	1.94	0.48
1:A:561:LEU:O	1:A:609:THR:HA	2.13	0.48
1:B:93:ALA:HB3	1:B:168:PHE:CE2	2.48	0.48
1:B:278:THR:HG22	1:B:282:VAL:HB	1.96	0.48
1:A:193:ILE:HD11	1:B:188:GLY:O	2.13	0.48
1:A:332:ALA:HB3	1:A:333:PRO:HD3	1.96	0.48
1:A:685:TYR:HA	1:A:729:TYR:OH	2.13	0.48
1:B:256:THR:HG22	1:B:257:VAL:N	2.29	0.48
1:B:272:HIS:ND1	1:B:290:PRO:HB3	2.29	0.48
1:B:408:TYR:CB	1:B:411:LEU:HD12	2.32	0.48
1:A:67:LEU:HA	1:A:67:LEU:HD13	1.52	0.48
1:A:561:LEU:HD11	1:A:612:LEU:CD1	2.43	0.48
1:B:766:CYS:O	1:B:769:LYS:HB3	2.14	0.48
1:B:825:LEU:HD11	1:B:858:LEU:HD13	1.96	0.48
1:B:366:ARG:HD2	1:B:413:PHE:CE1	2.49	0.48
1:A:106:GLN:HG3	1:A:155:LYS:NZ	2.28	0.48
1:A:585:LEU:HD12	1:A:608:LYS:HB2	1.96	0.48
1:A:647:LEU:O	1:A:651:HIS:HB3	2.14	0.48
1:A:922:GLU:HG3	1:A:926:SER:O	2.14	0.48
1:B:64:TRP:CE2	1:B:70:PRO:HG3	2.49	0.48
1:B:567:LEU:HD12	1:B:570:VAL:HG11	1.96	0.47
1:B:656:PRO:HA	1:B:659:ARG:HD3	1.95	0.47
1:B:843:LEU:HB3	1:B:849:VAL:CG1	2.44	0.47
1:A:731:LYS:N	1:A:732:PRO:HD2	2.29	0.47
1:B:764:ALA:N	1:B:765:PRO:HD2	2.29	0.47
1:B:777:TRP:N	1:B:784:LEU:HD23	2.30	0.47
1:A:106:GLN:CG	1:A:155:LYS:HE2	2.44	0.47
1:B:532:ALA:HA	10:B:2414:HOH:O	2.12	0.47
1:B:888:ASP:O	1:B:889:LEU:HB3	2.14	0.47
1:A:96:LYS:HE2	1:A:165:ALA:HB2	1.95	0.47
1:A:142:TYR:HE2	1:A:145:HIS:CD2	2.31	0.47
1:B:715:ILE:HD12	1:B:715:ILE:O	2.14	0.47
1:B:777:TRP:CA	1:B:784:LEU:HD23	2.43	0.47
1:B:911:LEU:HD13	1:B:911:LEU:O	2.14	0.47
1:A:73:VAL:HG11	1:A:108:ILE:HD12	1.93	0.47
1:A:509:THR:OG1	1:A:510:SER:N	2.46	0.47
1:B:200:GLU:HA	1:B:201:PRO:HA	1.65	0.47
1:B:731:LYS:N	1:B:732:PRO:HD2	2.29	0.47
1:A:236:MET:HE1	1:A:320:LEU:HD22	1.96	0.47
1:A:838:LEU:HD12	1:A:871:LEU:HD11	1.97	0.47
1:B:75:PRO:HD2	1:B:216:PHE:CD2	2.46	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:830:THR:HA	1:A:865:ARG:NE	2.29	0.47
1:B:64:TRP:CD2	1:B:70:PRO:HG3	2.50	0.47
1:B:584:TYR:HB3	1:B:586:TRP:CZ3	2.50	0.47
1:B:611:THR:OG1	1:B:612:LEU:N	2.48	0.47
1:B:306:LEU:HD22	1:B:403:ALA:HB1	1.96	0.47
1:B:757:LEU:H	1:B:757:LEU:CD2	2.26	0.47
1:B:916:LEU:O	1:B:917:PHE:HB3	2.14	0.47
1:B:69:LEU:HG	1:B:111:HIS:CE1	2.50	0.46
1:B:792:LYS:HE2	1:B:823:LYS:HG2	1.97	0.46
1:B:839:LYS:O	1:B:843:LEU:HG	2.16	0.46
1:B:108:ILE:O	1:B:109:ILE:HD13	2.15	0.46
1:B:465:LEU:HD11	1:B:469:LEU:CD1	2.46	0.46
1:B:568:GLN:NE2	1:B:668:GLN:HG3	2.22	0.46
1:B:870:GLN:O	1:B:870:GLN:HG3	2.14	0.46
1:A:722:LEU:HG	1:A:956:LEU:HD11	1.97	0.46
1:A:316:ILE:HD11	1:A:483:LYS:HG3	1.98	0.46
1:B:424:VAL:HG13	1:B:630:TYR:OH	2.16	0.46
1:B:622:LYS:HZ1	1:B:624:ASN:HB3	1.80	0.46
1:A:242:ILE:HD11	1:A:250:GLU:OE1	2.15	0.46
1:A:484:LYS:O	1:A:484:LYS:HG2	2.16	0.46
6:B:2301:7OO:C12	6:B:2301:7OO:C14	2.94	0.46
1:A:73:VAL:HG21	1:A:108:ILE:CD1	2.25	0.45
1:A:226:ARG:HD2	1:A:230:HIS:O	2.16	0.45
1:A:280:SER:OG	1:A:311:GLU:OE1	2.30	0.45
1:B:436:ILE:HD11	1:B:458:GLY:CA	2.45	0.45
1:B:828:LEU:HB3	1:B:840:LEU:HD11	1.98	0.45
1:A:505:GLU:HA	1:A:508:PHE:HD2	1.82	0.45
1:A:638:HIS:O	1:A:642:GLN:HG2	2.16	0.45
1:A:884:LEU:HA	1:A:884:LEU:HD23	1.65	0.45
1:A:462:LEU:HD23	1:A:462:LEU:HA	1.69	0.45
1:A:382:THR:O	1:A:489:ASN:HA	2.17	0.45
1:A:641:ASP:OD1	1:A:641:ASP:N	2.49	0.45
1:B:791:LEU:HD22	1:B:795:TYR:CE2	2.52	0.45
1:A:98:GLU:HG3	1:A:163:TYR:CE1	2.51	0.45
1:A:476:LYS:HE3	1:A:503:CYS:O	2.16	0.45
1:B:496:TRP:CZ3	1:B:538:MET:HG3	2.51	0.45
1:B:284:VAL:HA	1:B:323:LEU:O	2.16	0.45
1:B:335:ALA:HA	1:B:343:THR:O	2.17	0.45
1:B:411:LEU:CA	1:B:745:VAL:HG21	2.42	0.45
1:A:751:ARG:HH11	1:A:751:ARG:HD2	1.60	0.45
1:B:395:PHE:CE2	1:B:462:LEU:HD11	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:481:TYR:CD1	1:B:495:LEU:HD12	2.52	0.45
1:B:537:MET:CE	1:B:589:PRO:HB3	2.47	0.45
1:A:184:TYR:HB3	1:A:329:PRO:HG2	1.99	0.45
1:A:655:ARG:O	1:A:658:ASP:HB2	2.17	0.45
1:A:110:LEU:HD21	1:A:211:PHE:CE2	2.52	0.45
1:B:137:LEU:HD12	1:B:137:LEU:N	2.31	0.45
1:B:436:ILE:HD11	1:B:458:GLY:HA2	1.99	0.45
1:B:63:PRO:HB2	1:B:107:PHE:CE2	2.51	0.45
1:B:124:SER:HB2	1:B:162:TYR:HD2	1.82	0.45
1:A:95:GLU:O	1:A:165:ALA:HA	2.17	0.44
1:A:594:THR:CG2	1:A:597:SER:N	2.70	0.44
1:B:339:TRP:CE3	1:B:379:ASN:HB3	2.51	0.44
1:B:465:LEU:HD12	1:B:465:LEU:HA	1.75	0.44
1:B:545:LYS:HB3	1:B:545:LYS:HE2	1.56	0.44
1:B:750:LEU:O	1:B:754:LEU:HB2	2.17	0.44
1:A:472:GLU:HG3	1:A:504:LEU:HD11	1.99	0.44
1:A:744:SER:O	1:A:748:ARG:HG3	2.16	0.44
1:B:80:LEU:HD22	1:B:81:PHE:N	2.31	0.44
1:B:537:MET:HE1	1:B:589:PRO:HG3	1.98	0.44
1:A:762:ASN:HA	1:A:767:ILE:HD11	1.99	0.44
1:B:157:THR:HA	1:B:158:PRO:HD3	1.84	0.44
1:B:273:SER:O	1:B:274:LEU:HD23	2.17	0.44
1:B:331:PHE:CD2	1:B:333:PRO:HD2	2.51	0.44
1:B:377:PHE:CE1	1:B:482:LEU:HD21	2.53	0.44
1:B:712:ARG:HA	1:B:866:PRO:HB3	2.00	0.44
1:A:142:TYR:CE2	1:A:145:HIS:CD2	3.06	0.44
1:A:679:LYS:HA	1:A:682:ASP:HB2	1.99	0.44
1:A:748:ARG:HG2	1:A:751:ARG:HH12	1.82	0.44
1:B:178:GLY:O	1:B:197:THR:HA	2.17	0.44
1:A:239:VAL:HG12	1:A:240:LYS:HG2	2.00	0.44
1:A:296:THR:HG22	1:A:350:LEU:CD2	2.47	0.44
1:A:561:LEU:HD11	1:A:612:LEU:HD12	2.00	0.44
1:A:954:THR:O	1:A:958:VAL:HG23	2.17	0.44
1:A:755:LEU:HD23	1:A:755:LEU:HA	1.85	0.44
1:B:67:LEU:N	1:B:67:LEU:HD12	2.33	0.44
1:B:82:VAL:HG12	1:B:84:PRO:HD3	2.00	0.44
1:B:101:VAL:HG11	1:B:162:TYR:HE1	1.82	0.44
1:B:740:SER:HA	1:B:787:PRO:CB	2.47	0.44
1:B:898:ILE:O	1:B:902:THR:HG23	2.18	0.44
1:B:331:PHE:CE2	1:B:333:PRO:HD2	2.53	0.43
1:B:562:GLN:HG3	1:B:564:GLU:OE2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:GLU:OE1	1:A:166:MET:HE3	2.17	0.43
1:A:418:LEU:HA	1:A:418:LEU:HD23	1.80	0.43
1:B:372:LEU:N	1:B:372:LEU:HD12	2.32	0.43
1:B:817:SER:O	1:B:821:GLN:HG2	2.17	0.43
1:B:954:THR:HG22	1:B:954:THR:O	2.18	0.43
1:A:107:PHE:HA	1:A:152:VAL:HG23	2.01	0.43
1:A:166:MET:HE3	1:A:166:MET:HB2	1.93	0.43
1:A:388:ASP:HB3	1:A:391:LEU:CD1	2.46	0.43
1:A:535:LYS:O	1:A:539:THR:OG1	2.28	0.43
1:A:577:TRP:O	1:A:581:GLN:HG2	2.18	0.43
1:B:433:SER:O	1:B:545:LYS:HD3	2.18	0.43
1:B:284:VAL:HG12	1:B:300:LEU:CD1	2.48	0.43
1:B:418:LEU:HD11	1:B:627:SER:HB2	2.01	0.43
1:B:777:TRP:CB	1:B:784:LEU:HD23	2.48	0.43
1:A:105:THR:HG22	1:A:106:GLN:N	2.34	0.43
1:A:650:ASN:OD1	1:A:652:THR:HG22	2.19	0.43
1:B:693:SER:HA	1:B:696:LEU:HB3	2.01	0.43
1:B:700:LEU:C	1:B:700:LEU:CD1	2.85	0.43
1:B:911:LEU:HD23	1:B:938:ILE:CB	2.42	0.43
1:B:552:VAL:HG11	1:B:623:PHE:CD2	2.54	0.43
1:A:714:ASN:ND2	5:A:1004:NAG:O7	2.52	0.43
1:A:774:PHE:HB2	1:A:794:VAL:HG13	2.01	0.43
1:B:549:LEU:HD12	1:B:550:LEU:H	1.83	0.43
1:A:398:TYR:CZ	1:A:402:ILE:HD11	2.53	0.43
1:B:706:PHE:O	1:B:710:MET:HG3	2.19	0.43
1:A:93:ALA:HB3	1:A:168:PHE:CE2	2.54	0.43
1:A:227:GLU:HG3	2:D:1:NAG:H83	2.01	0.43
1:A:338:ASN:HB2	1:A:341:LEU:O	2.19	0.43
1:B:145:HIS:O	1:B:147:GLN:HG3	2.19	0.43
1:B:593:SER:O	1:B:620:TRP:HZ3	2.02	0.43
1:B:622:LYS:HZ1	1:B:624:ASN:N	2.16	0.43
1:B:652:THR:O	1:B:652:THR:HG22	2.18	0.43
1:A:190:GLU:HG2	1:B:193:ILE:HG13	2.01	0.42
1:A:741:ASP:HA	1:A:751:ARG:HH12	1.83	0.42
1:A:784:LEU:HD13	1:A:785:ASN:CA	2.48	0.42
1:B:53:PHE:HB3	1:B:54:PRO:HD2	2.01	0.42
1:B:465:LEU:HG	1:B:469:LEU:HD12	2.01	0.42
1:B:710:MET:CE	1:B:718:ILE:HG22	2.48	0.42
1:A:110:LEU:HA	1:A:110:LEU:HD23	1.71	0.42
1:A:452:GLU:O	1:A:456:ASN:HB2	2.19	0.42
1:B:129:ARG:CD	1:B:129:ARG:H	2.32	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:236:MET:HB3	1:B:237:PRO:HD2	2.01	0.42
1:B:296:THR:HG22	1:B:350:LEU:HD22	2.01	0.42
1:B:670:VAL:CG1	1:B:948:ASN:HD21	2.32	0.42
1:A:444:THR:O	1:A:448:GLU:HG3	2.19	0.42
1:A:591:THR:OG1	1:A:624:ASN:HA	2.19	0.42
1:B:565:ARG:HD2	1:B:586:TRP:HH2	1.85	0.42
1:A:436:ILE:HD11	1:A:457:LYS:CG	2.28	0.42
1:A:949:LEU:HD12	1:A:949:LEU:O	2.19	0.42
1:A:105:THR:HG21	1:A:107:PHE:O	2.19	0.42
1:A:152:VAL:CG1	1:A:156:LEU:HD21	2.49	0.42
1:A:664:HIS:O	1:A:668:GLN:HG2	2.19	0.42
1:A:718:ILE:HG23	1:A:956:LEU:HD12	2.00	0.42
1:A:764:ALA:HB3	1:A:765:PRO:HD3	2.00	0.42
1:A:778:MET:HG3	1:A:807:TYR:CE2	2.55	0.42
1:B:360:ASP:OD2	1:B:823:LYS:NZ	2.53	0.42
1:B:372:LEU:HD12	1:B:372:LEU:H	1.85	0.42
1:B:418:LEU:HD12	1:B:418:LEU:HA	1.87	0.42
1:B:552:VAL:CG2	1:B:635:TYR:HA	2.46	0.42
1:B:804:GLY:O	1:B:807:TYR:N	2.53	0.42
1:A:63:PRO:HD3	1:A:140:LEU:HD23	2.01	0.42
1:A:120:ALA:HA	1:A:165:ALA:O	2.20	0.42
1:B:818:SER:HA	1:B:821:GLN:CG	2.49	0.42
1:B:286:ILE:HG21	1:B:296:THR:HB	2.02	0.42
1:B:565:ARG:HD3	1:B:584:TYR:CD2	2.55	0.42
1:B:808:LEU:HD23	1:B:808:LEU:HA	1.89	0.42
1:B:940:LYS:O	1:B:940:LYS:HG2	2.20	0.42
1:A:772:GLU:HG3	1:A:773:LEU:N	2.35	0.41
1:A:79:ASP:O	1:A:95:GLU:HA	2.20	0.41
1:A:105:THR:CG2	1:A:107:PHE:H	2.30	0.41
1:A:200:GLU:CG	1:A:201:PRO:HA	2.50	0.41
1:A:574:ASP:OD1	1:A:575:PRO:HD2	2.19	0.41
1:B:681:LEU:HD11	1:B:952:LEU:CD1	2.49	0.41
1:B:677:LEU:O	1:B:680:ALA:HB3	2.20	0.41
1:B:760:ASP:C	1:B:761:LEU:HD23	2.41	0.41
1:A:105:THR:O	1:A:155:LYS:HG3	2.21	0.41
1:A:238:LYS:HB3	1:A:238:LYS:HE3	1.75	0.41
1:A:451:ASP:OD1	1:A:453:VAL:N	2.49	0.41
1:B:194:LEU:HD23	1:B:194:LEU:N	2.35	0.41
1:B:278:THR:HG21	1:B:282:VAL:HB	2.02	0.41
1:B:309:PHE:CE2	1:B:406:ALA:HB3	2.55	0.41
1:A:213:GLU:HB2	1:A:216:PHE:CD2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:95:GLU:O	1:B:165:ALA:HA	2.21	0.41
1:B:905:PHE:C	1:B:938:ILE:HG23	2.40	0.41
3:J:1:NAG:H82	3:J:1:NAG:C1	2.51	0.41
1:A:223:LYS:HD3	1:A:252:HIS:CG	2.55	0.41
1:B:383:MET:SD	1:B:383:MET:N	2.93	0.41
1:B:552:VAL:HG11	1:B:623:PHE:CE2	2.55	0.41
1:B:742:LYS:O	1:B:751:ARG:NH1	2.40	0.41
1:A:191:THR:O	1:B:190:GLU:HB3	2.21	0.41
1:A:403:ALA:O	1:A:407:THR:HG23	2.19	0.41
1:B:327:ALA:HB1	1:B:346:GLU:HG2	2.02	0.41
1:B:351:PHE:HZ	1:B:361:LYS:HE2	1.82	0.41
1:B:624:ASN:HB2	1:B:633:VAL:CG1	2.51	0.41
1:B:725:TYR:CE1	1:B:729:TYR:HD2	2.38	0.41
1:A:318:TYR:CE2	1:A:320:LEU:HB2	2.56	0.41
1:A:623:PHE:N	1:A:635:TYR:OH	2.40	0.41
1:A:763:HIS:CD2	1:A:765:PRO:HD2	2.55	0.41
1:B:566:PHE:HZ	1:B:568:GLN:HE21	1.69	0.41
1:B:889:LEU:O	1:B:889:LEU:HG	2.21	0.41
3:J:1:NAG:H3	3:J:1:NAG:H83	2.03	0.41
1:A:681:LEU:HD23	1:A:681:LEU:HA	1.79	0.41
1:A:706:PHE:O	1:A:710:MET:HG2	2.20	0.41
1:B:681:LEU:HD11	1:B:952:LEU:HD13	2.03	0.41
1:A:51:GLY:O	1:A:61:ARG:CD	2.69	0.40
1:A:116:GLU:O	1:A:168:PHE:HA	2.21	0.40
1:B:327:ALA:O	1:B:329:PRO:HD3	2.20	0.40
1:B:655:ARG:CZ	1:B:655:ARG:HB2	2.51	0.40
1:A:784:LEU:HD13	1:A:785:ASN:C	2.42	0.40
1:B:110:LEU:HD12	1:B:148:ILE:HG13	2.03	0.40
1:B:156:LEU:HD22	1:B:156:LEU:H	1.86	0.40
1:B:236:MET:HE2	1:B:255:THR:O	2.22	0.40
1:A:122:LEU:HB2	1:A:137:LEU:HD11	2.03	0.40
1:A:331:PHE:CE2	1:A:333:PRO:HD2	2.56	0.40
1:B:441:GLU:N	1:B:445:GLN:OE1	2.42	0.40
1:A:425:ILE:HG12	1:A:547:ILE:HD12	2.03	0.40
1:A:825:LEU:HA	1:A:825:LEU:HD12	1.84	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:SER:OG	1:A:909:ASP:OD1[2_555]	2.17	0.03

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	916/963 (95%)	861 (94%)	54 (6%)	1 (0%)	51	78
1	B	861/963 (89%)	797 (93%)	63 (7%)	1 (0%)	51	78
All	All	1777/1926 (92%)	1658 (93%)	117 (7%)	2 (0%)	51	78

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	624	ASN
1	A	583	ARG

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	799/866 (92%)	780 (98%)	19 (2%)	49	77
1	B	695/866 (80%)	672 (97%)	23 (3%)	38	67
All	All	1494/1732 (86%)	1452 (97%)	42 (3%)	43	73

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	PHE
1	A	79	ASP
1	A	322	LYS
1	A	339	TRP

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Mol	Chain	Res	Type
1	A	359	SER
1	A	383	MET
1	A	427	LYS
1	A	522	SER
1	A	557	CYS
1	A	574	ASP
1	A	641	ASP
1	A	686	TYR
1	A	717	ASP
1	A	744	SER
1	A	835	GLU
1	A	886	LYS
1	A	896	MET
1	A	940	LYS
1	A	962	HIS
1	B	58	ASN
1	B	107	PHE
1	B	110	LEU
1	B	128	SER
1	B	129	ARG
1	B	279	SER
1	B	280	SER
1	B	293	ARG
1	B	322	LYS
1	B	345	ARG
1	B	383	MET
1	B	466	LYS
1	B	571	PHE
1	B	585	LEU
1	B	692	SER
1	B	702	TYR
1	B	705	SER
1	B	707	TYR
1	B	709	MET
1	B	729	TYR
1	B	740	SER
1	B	899	SER
1	B	932	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	869	GLN
1	A	904	HIS
1	B	58	ASN
1	B	563	GLN
1	B	776	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

24 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	C	1	1,2	14,14,15	0.44	0	17,19,21	0.49	0
2	NAG	C	2	2	14,14,15	0.53	0	17,19,21	0.41	0
2	BMA	C	3	2	11,11,12	0.84	0	15,15,17	1.22	2 (13%)
2	NAG	D	1	1,2	14,14,15	0.37	0	17,19,21	0.64	0
2	NAG	D	2	2	14,14,15	0.82	1 (7%)	17,19,21	0.72	0
2	BMA	D	3	2	11,11,12	0.72	0	15,15,17	0.76	0
2	NAG	E	1	1,2	14,14,15	0.53	0	17,19,21	0.71	0
2	NAG	E	2	2	14,14,15	0.33	0	17,19,21	0.43	0
2	BMA	E	3	2	11,11,12	1.20	2 (18%)	15,15,17	0.93	1 (6%)
3	NAG	F	1	1,3	14,14,15	0.27	0	17,19,21	0.41	0
3	NAG	F	2	3	14,14,15	0.26	0	17,19,21	0.49	0
4	NAG	G	1	1,4	14,14,15	0.78	1 (7%)	17,19,21	0.58	0
4	NAG	G	2	4	14,14,15	0.71	0	17,19,21	0.58	0
4	BMA	G	3	4	11,11,12	0.94	0	15,15,17	0.87	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	MAN	G	4	4	11,11,12	1.23	1 (9%)	15,15,17	1.14	0
4	MAN	G	5	4	11,11,12	1.22	2 (18%)	15,15,17	1.23	2 (13%)
3	NAG	H	1	1,3	14,14,15	0.39	0	17,19,21	0.45	0
3	NAG	H	2	3	14,14,15	1.02	1 (7%)	17,19,21	0.54	0
3	NAG	I	1	1,3	14,14,15	0.66	1 (7%)	17,19,21	0.74	1 (5%)
3	NAG	I	2	3	14,14,15	0.87	1 (7%)	17,19,21	0.77	1 (5%)
3	NAG	J	1	1,3	14,14,15	2.47	3 (21%)	17,19,21	1.93	5 (29%)
3	NAG	J	2	3	14,14,15	1.46	2 (14%)	17,19,21	0.97	2 (11%)
3	NAG	K	1	1,3	14,14,15	0.56	0	17,19,21	0.68	0
3	NAG	K	2	3	14,14,15	0.59	0	17,19,21	0.76	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	C	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	C	2	2	-	1/6/23/26	0/1/1/1
2	BMA	C	3	2	-	2/2/19/22	0/1/1/1
2	NAG	D	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1
2	BMA	D	3	2	-	2/2/19/22	0/1/1/1
2	NAG	E	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1
2	BMA	E	3	2	-	2/2/19/22	0/1/1/1
3	NAG	F	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	F	2	3	-	0/6/23/26	0/1/1/1
4	NAG	G	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	G	2	4	-	0/6/23/26	0/1/1/1
4	BMA	G	3	4	-	0/2/19/22	0/1/1/1
4	MAN	G	4	4	-	1/2/19/22	0/1/1/1
4	MAN	G	5	4	-	0/2/19/22	0/1/1/1
3	NAG	H	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	H	2	3	-	0/6/23/26	0/1/1/1
3	NAG	I	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	I	2	3	-	3/6/23/26	0/1/1/1
3	NAG	J	1	1,3	-	3/6/23/26	0/1/1/1
3	NAG	J	2	3	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	K	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	K	2	3	-	<mark>4/6/23/26</mark>	0/1/1/1

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	J	1	NAG	O5-C1	-8.38	1.30	1.43
3	J	2	NAG	O5-C1	-4.67	1.36	1.43
3	H	2	NAG	O5-C1	-3.65	1.37	1.43
3	I	2	NAG	C1-C2	3.04	1.56	1.52
4	G	4	MAN	C2-C3	2.89	1.56	1.52
4	G	5	MAN	O5-C5	2.80	1.49	1.43
3	J	1	NAG	C1-C2	2.64	1.56	1.52
2	E	3	BMA	C4-C5	2.59	1.58	1.53
4	G	1	NAG	O5-C1	-2.51	1.39	1.43
2	D	2	NAG	C1-C2	-2.31	1.48	1.52
4	G	5	MAN	O5-C1	-2.27	1.40	1.43
3	J	1	NAG	C3-C2	-2.25	1.47	1.52
3	J	2	NAG	C1-C2	2.24	1.55	1.52
3	I	1	NAG	C1-C2	2.12	1.55	1.52
2	E	3	BMA	O5-C5	2.07	1.47	1.43

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	J	1	NAG	C4-C3-C2	-4.11	105.00	111.02
3	J	1	NAG	C1-C2-N2	3.74	116.88	110.49
3	J	1	NAG	C2-N2-C7	3.35	127.67	122.90
4	G	5	MAN	O2-C2-C3	-2.73	104.67	110.14
3	J	2	NAG	C4-C3-C2	2.68	114.94	111.02
4	G	5	MAN	C1-O5-C5	2.54	115.63	112.19
3	J	1	NAG	O5-C5-C4	-2.45	104.88	110.83
3	J	1	NAG	C1-O5-C5	-2.26	109.13	112.19
2	E	3	BMA	C1-O5-C5	2.26	115.25	112.19
3	I	2	NAG	C1-O5-C5	2.17	115.13	112.19
3	J	2	NAG	O5-C5-C4	-2.16	105.57	110.83
3	I	1	NAG	C1-O5-C5	-2.11	109.33	112.19
2	C	3	BMA	O3-C3-C2	2.10	114.01	109.99
2	C	3	BMA	C1-O5-C5	2.05	114.97	112.19

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	3	BMA	C4-C5-C6-O6
3	J	2	NAG	O5-C5-C6-O6
3	I	2	NAG	O5-C5-C6-O6
2	C	3	BMA	O5-C5-C6-O6
3	J	1	NAG	C8-C7-N2-C2
3	J	1	NAG	O7-C7-N2-C2
3	K	2	NAG	C8-C7-N2-C2
3	K	2	NAG	O7-C7-N2-C2
2	D	3	BMA	C4-C5-C6-O6
3	K	2	NAG	O5-C5-C6-O6
4	G	1	NAG	O5-C5-C6-O6
2	D	3	BMA	O5-C5-C6-O6
3	I	1	NAG	O5-C5-C6-O6
4	G	1	NAG	C4-C5-C6-O6
4	G	4	MAN	O5-C5-C6-O6
2	E	3	BMA	C4-C5-C6-O6
3	I	2	NAG	C4-C5-C6-O6
2	C	1	NAG	C4-C5-C6-O6
3	I	2	NAG	C1-C2-N2-C7
3	J	1	NAG	C1-C2-N2-C7
2	D	1	NAG	O5-C5-C6-O6
2	D	1	NAG	C4-C5-C6-O6
2	E	3	BMA	O5-C5-C6-O6
3	I	1	NAG	C3-C2-N2-C7
3	J	2	NAG	C3-C2-N2-C7
3	K	2	NAG	C4-C5-C6-O6
2	C	1	NAG	O5-C5-C6-O6
2	C	2	NAG	C4-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	J	1	NAG	2	0
2	D	1	NAG	1	0
2	C	1	NAG	1	0

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

Oligosaccharide Chain C

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain H

Bond lengths

Bond angles

Torsions

Rings

Full wwPDB X-ray Structure Validation Report

Oligosaccharide Chain I

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain J

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain K

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths

Bond angles

Torsions

Rings

5.6 Ligand geometry ⓘ

Of 16 ligands modelled in this entry, 2 are monoatomic - leaving 14 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
5	NAG	A	1001	1	14,14,15	0.92	1 (7%)	17,19,21	1.06	1 (5%)
5	NAG	B	2302	1	14,14,15	0.92	2 (14%)	17,19,21	0.93	1 (5%)
5	NAG	A	1002	1	14,14,15	0.40	0	17,19,21	0.58	0
6	7OO	B	2301	9	44,48,48	1.85	7 (15%)	54,66,66	1.45	9 (16%)
5	NAG	B	2303	1	14,14,15	0.91	1 (7%)	17,19,21	1.08	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
5	NAG	A	1005	1	14,14,15	1.45	1 (7%)	17,19,21	3.11	5 (29%)
5	NAG	A	1004	1	14,14,15	0.39	0	17,19,21	1.31	4 (23%)
8	IMD	A	1010	-	3,5,5	0.38	0	4,5,5	0.61	0
6	7OO	A	1006	9	44,48,48	1.87	6 (13%)	54,66,66	1.80	14 (25%)
7	EDO	A	1008	-	3,3,3	0.53	0	2,2,2	0.50	0
7	EDO	A	1009	-	3,3,3	0.50	0	2,2,2	0.37	0
5	NAG	A	1003	1	14,14,15	0.43	0	17,19,21	0.48	0
7	EDO	A	1007	-	3,3,3	0.47	0	2,2,2	0.24	0
5	NAG	B	2304	1	14,14,15	0.82	1 (7%)	17,19,21	0.92	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
5	NAG	A	1001	1	-	0/6/23/26	0/1/1/1
5	NAG	B	2302	1	-	4/6/23/26	0/1/1/1
5	NAG	A	1002	1	-	1/6/23/26	0/1/1/1
6	7OO	B	2301	9	-	8/38/44/44	0/4/4/4
5	NAG	B	2303	1	-	1/6/23/26	0/1/1/1
5	NAG	A	1005	1	-	3/6/23/26	0/1/1/1
5	NAG	A	1004	1	-	1/6/23/26	0/1/1/1
8	IMD	A	1010	-	-	-	0/1/1/1
6	7OO	A	1006	9	-	12/38/44/44	0/4/4/4
7	EDO	A	1008	-	-	1/1/1/1	-
7	EDO	A	1009	-	-	0/1/1/1	-
5	NAG	A	1003	1	-	3/6/23/26	0/1/1/1
7	EDO	A	1007	-	-	1/1/1/1	-
5	NAG	B	2304	1	-	2/6/23/26	0/1/1/1

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	2301	7OO	P03-C05	7.23	1.86	1.79
6	A	1006	7OO	P03-C05	7.20	1.86	1.79
6	B	2301	7OO	C07-N08	5.17	1.45	1.34
5	A	1005	NAG	O5-C1	-4.96	1.35	1.43
6	A	1006	7OO	C07-N08	4.76	1.44	1.34
6	A	1006	7OO	C09-C14	-4.65	1.44	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1006	7OO	C14-N15	4.13	1.43	1.32
6	B	2301	7OO	C09-C14	-3.57	1.46	1.52
5	A	1001	NAG	O5-C1	3.20	1.48	1.43
6	B	2301	7OO	C14-N15	3.13	1.40	1.32
5	B	2303	NAG	C1-C2	2.93	1.56	1.52
6	A	1006	7OO	C06-C07	-2.71	1.46	1.51
5	B	2304	NAG	O5-C1	2.59	1.47	1.43
5	B	2302	NAG	O5-C1	2.49	1.47	1.43
6	B	2301	7OO	C06-C07	-2.48	1.47	1.51
5	B	2302	NAG	C1-C2	2.20	1.55	1.52
6	A	1006	7OO	C02-N01	-2.05	1.42	1.48
6	B	2301	7OO	C18-C06	-2.04	1.47	1.53
6	B	2301	7OO	C30-C29	2.02	1.54	1.49

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1005	NAG	C2-N2-C7	11.09	138.70	122.90
6	A	1006	7OO	C14-C09-N08	5.15	122.66	110.18
6	A	1006	7OO	C13-C11-C10	4.32	126.99	111.11
6	B	2301	7OO	C13-C11-C10	3.56	124.19	111.11
5	B	2302	NAG	C1-O5-C5	3.38	116.77	112.19
6	B	2301	7OO	C36-C29-C30	-3.26	115.47	120.86
6	B	2301	7OO	C14-C09-N08	3.23	118.00	110.18
5	A	1005	NAG	C1-C2-N2	-3.11	105.17	110.49
6	A	1006	7OO	C36-C29-C30	-3.11	115.72	120.86
6	A	1006	7OO	C35-C30-C31	3.07	123.72	117.59
6	B	2301	7OO	C19-C18-C06	-3.07	108.09	113.72
6	A	1006	7OO	C31-C30-C29	-3.06	116.05	121.36
6	B	2301	7OO	C31-C30-C29	-2.97	116.21	121.36
5	A	1001	NAG	C1-O5-C5	2.94	116.18	112.19
6	A	1006	7OO	C10-C09-N08	-2.92	103.86	110.58
6	A	1006	7OO	C36-C29-C28	2.85	122.53	118.31
5	B	2303	NAG	C1-O5-C5	2.78	115.96	112.19
6	A	1006	7OO	O17-C07-C06	-2.77	118.52	122.12
6	A	1006	7OO	C19-C18-C06	-2.73	108.71	113.72
5	A	1004	NAG	C3-C4-C5	2.64	114.94	110.24
5	B	2304	NAG	C1-O5-C5	2.57	115.67	112.19
6	B	2301	7OO	C10-C09-N08	-2.56	104.67	110.58
6	A	1006	7OO	C34-C35-C30	-2.54	117.37	120.56
5	A	1005	NAG	C4-C3-C2	-2.49	107.36	111.02
5	A	1005	NAG	C1-O5-C5	-2.45	108.87	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	A	1006	7OO	P03-C02-C38	2.44	116.00	111.10
6	B	2301	7OO	C23-C22-C21	-2.39	117.21	121.36
5	A	1004	NAG	C2-N2-C7	2.39	126.31	122.90
5	A	1004	NAG	C1-C2-N2	2.39	114.56	110.49
6	B	2301	7OO	C38-C39-C40	2.37	121.43	113.18
5	A	1005	NAG	O3-C3-C2	2.30	114.23	109.47
6	B	2301	7OO	C20-C21-C22	-2.28	117.09	120.86
6	A	1006	7OO	C06-C07-N08	2.24	120.08	116.21
5	A	1004	NAG	C1-O5-C5	2.23	115.22	112.19
6	A	1006	7OO	C09-N08-C07	-2.03	117.31	121.67
6	A	1006	7OO	C29-C36-C19	-2.02	118.44	121.19

There are no chirality outliers.

All (37) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1003	NAG	C1-C2-N2-C7
5	A	1005	NAG	C3-C2-N2-C7
5	A	1005	NAG	C8-C7-N2-C2
6	A	1006	7OO	C06-C05-P03-O04
6	B	2301	7OO	C06-C05-P03-O04
5	A	1005	NAG	O7-C7-N2-C2
6	A	1006	7OO	C28-C29-C30-C31
6	A	1006	7OO	C36-C29-C30-C31
6	A	1006	7OO	C36-C29-C30-C35
6	A	1006	7OO	C28-C29-C30-C35
5	B	2302	NAG	O5-C5-C6-O6
5	B	2302	NAG	C8-C7-N2-C2
5	B	2302	NAG	O7-C7-N2-C2
5	B	2302	NAG	C4-C5-C6-O6
6	A	1006	7OO	C09-C10-C11-C12
5	A	1002	NAG	O5-C5-C6-O6
5	B	2303	NAG	O5-C5-C6-O6
5	A	1004	NAG	C3-C2-N2-C7
6	A	1006	7OO	C09-C10-C11-C13
6	A	1006	7OO	C06-C05-P03-O37
6	B	2301	7OO	C06-C05-P03-O37
5	B	2304	NAG	C4-C5-C6-O6
6	A	1006	7OO	P03-C05-C06-C18
6	B	2301	7OO	P03-C05-C06-C18
6	A	1006	7OO	P03-C05-C06-C07
6	B	2301	7OO	P03-C05-C06-C07

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Mol	Chain	Res	Type	Atoms
7	A	1007	EDO	O1-C1-C2-O2
5	B	2304	NAG	O5-C5-C6-O6
5	A	1003	NAG	C3-C2-N2-C7
6	B	2301	7OO	C28-C29-C30-C35
5	A	1003	NAG	O5-C5-C6-O6
7	A	1008	EDO	O1-C1-C2-O2
6	B	2301	7OO	C36-C29-C30-C35
6	B	2301	7OO	C36-C29-C30-C31
6	A	1006	7OO	N08-C09-C14-N15
6	A	1006	7OO	C07-C06-C18-C19
6	B	2301	7OO	C28-C29-C30-C31

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	2301	7OO	2	0
5	A	1004	NAG	1	0
6	A	1006	7OO	2	0
5	A	1003	NAG	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand 7OO B 2301

Bond lengths

Bond angles

Torsions

Rings

Ligand 7OO A 1006

Bond lengths

Bond angles

Torsions

Rings
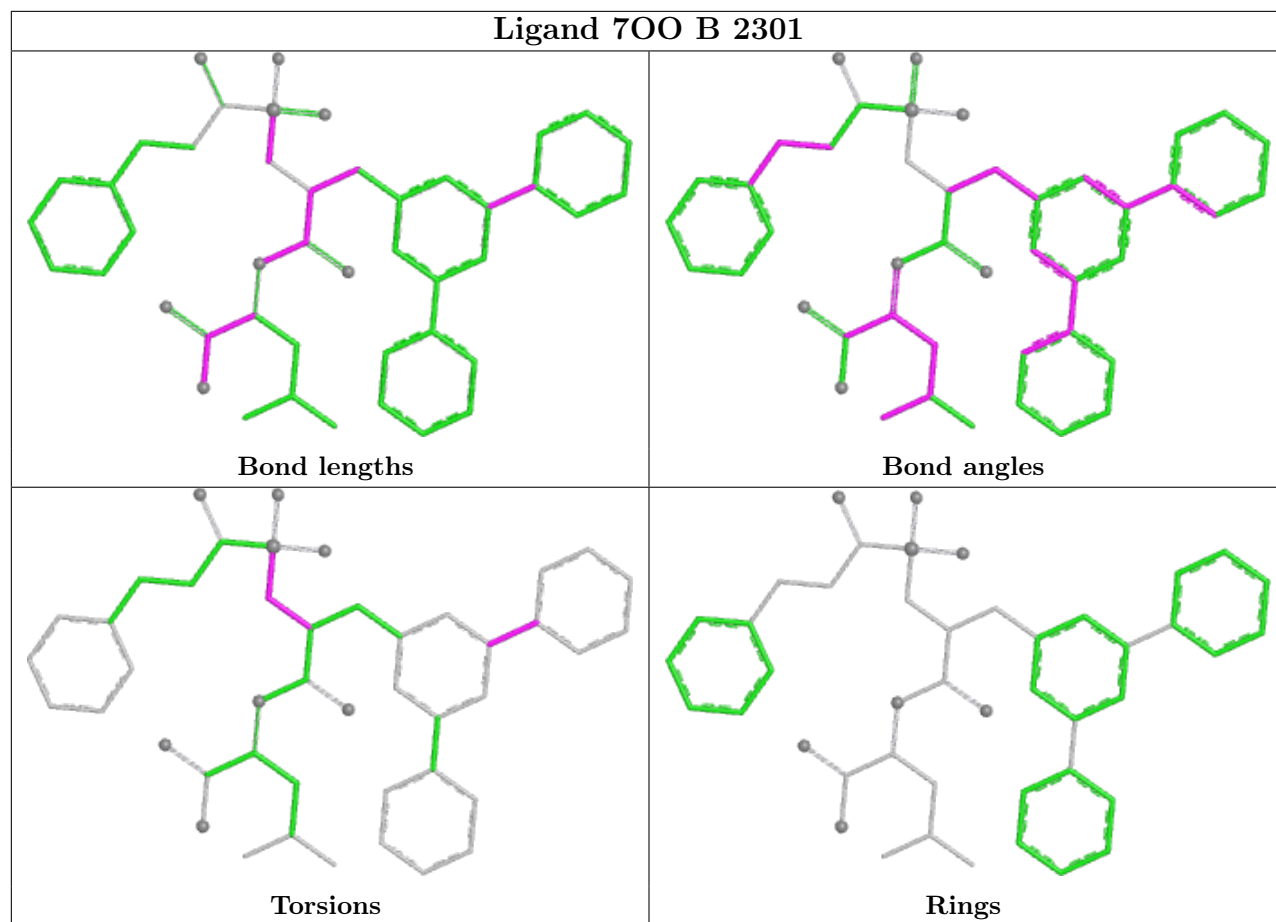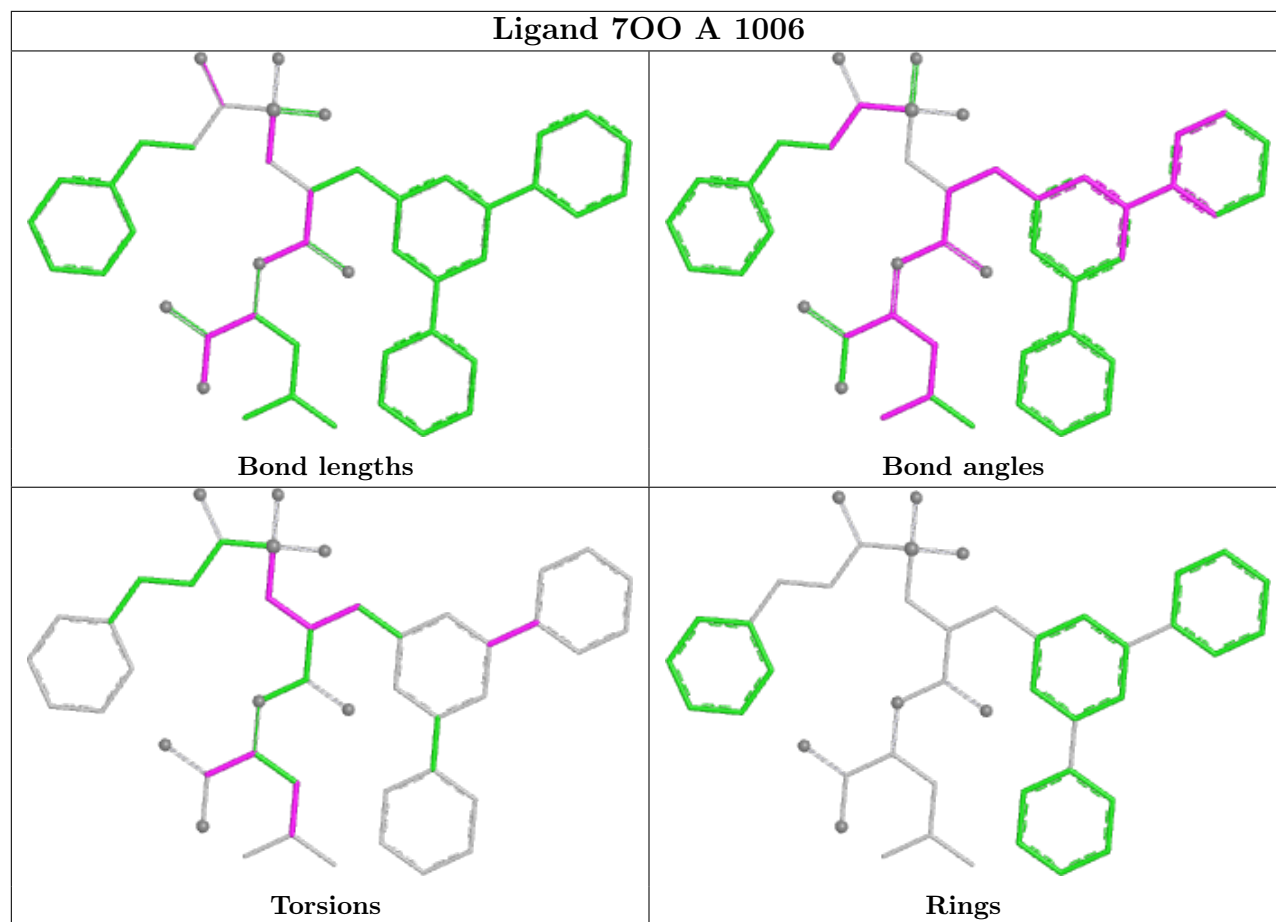
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	916/963 (95%)	0.12	12 (1%)	77	78	26, 62, 112, 171	0
1	B	872/963 (90%)	0.43	54 (6%)	20	19	34, 93, 145, 196	0
All	All	1788/1926 (92%)	0.27	66 (3%)	41	41	26, 74, 136, 196	0

All (66) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	680	ALA	8.5
1	B	623	PHE	6.3
1	B	654	LEU	5.5
1	B	710	MET	5.0
1	B	837	LEU	4.9
1	B	592	TYR	4.7
1	B	773	LEU	4.5
1	B	621	VAL	4.1
1	B	703	LEU	3.8
1	B	797	VAL	3.7
1	B	593	SER	3.7
1	B	552	VAL	3.6
1	B	52	ALA	3.4
1	B	762	ASN	3.4
1	B	672	ALA	3.4
1	B	72	VAL	3.3
1	B	570	VAL	3.3
1	B	952	LEU	3.2
1	B	758	ALA	3.2
1	B	784	LEU	3.1
1	A	559	LEU	3.1
1	A	510	SER	2.9
1	B	706	PHE	2.9
1	B	714	ASN	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	763	HIS	2.8
1	B	556	GLY	2.8
1	B	755	LEU	2.7
1	A	520	MET	2.7
1	B	615	PRO	2.7
1	B	601	HIS	2.7
1	B	673	GLY	2.7
1	B	726	LEU	2.6
1	B	774	PHE	2.6
1	B	569	GLY	2.6
1	B	761	LEU	2.6
1	B	401	LEU	2.6
1	B	99	VAL	2.5
1	B	557	CYS	2.5
1	B	638	HIS	2.5
1	B	107	PHE	2.5
1	B	50	PRO	2.5
1	B	616	GLU	2.5
1	B	799	ALA	2.5
1	B	750	LEU	2.5
1	B	571	PHE	2.5
1	A	140	LEU	2.4
1	A	330	ASP	2.4
1	B	624	ASN	2.3
1	A	556	GLY	2.3
1	B	775	SER	2.3
1	A	553	LYS	2.3
1	B	317	TYR	2.3
1	B	730	PHE	2.3
1	B	767	ILE	2.2
1	B	724	ARG	2.2
1	A	48	GLU	2.1
1	A	182	SER	2.1
1	A	416	TYR	2.1
1	A	59	GLY	2.1
1	B	666	VAL	2.1
1	B	722	LEU	2.1
1	B	713	ARG	2.1
1	B	61	ARG	2.0
1	A	50	PRO	2.0
1	B	73	VAL	2.0
1	B	712	ARG	2.0

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

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

6.3 Carbohydrates ⓘ

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	BMA	E	3	11/12	0.64	0.17	105,141,151,154	0
3	NAG	K	2	14/15	0.78	0.34	145,167,172,175	0
3	NAG	F	2	14/15	0.80	0.17	148,167,175,178	0
3	NAG	I	1	14/15	0.83	0.15	120,151,171,178	0
3	NAG	I	2	14/15	0.84	0.16	139,162,172,176	0
4	MAN	G	4	11/12	0.84	0.17	110,115,132,136	0
2	BMA	C	3	11/12	0.85	0.16	113,125,136,139	0
2	NAG	E	2	14/15	0.88	0.16	115,136,144,151	0
3	NAG	J	2	14/15	0.89	0.46	145,182,190,193	0
2	BMA	D	3	11/12	0.90	0.12	122,126,132,133	0
3	NAG	H	2	14/15	0.90	0.18	92,103,120,123	0
3	NAG	J	1	14/15	0.90	0.24	123,149,172,177	0
3	NAG	K	1	14/15	0.91	0.26	99,120,132,154	0
2	NAG	E	1	14/15	0.92	0.15	83,93,106,127	0
3	NAG	H	1	14/15	0.92	0.17	63,94,117,118	0
4	MAN	G	5	11/12	0.92	0.17	70,86,101,104	0
2	NAG	D	2	14/15	0.93	0.12	88,110,120,122	0
3	NAG	F	1	14/15	0.94	0.10	100,120,131,149	0
2	NAG	D	1	14/15	0.95	0.14	53,84,95,100	0
4	BMA	G	3	11/12	0.95	0.10	71,77,93,102	0
4	NAG	G	2	14/15	0.96	0.14	62,67,77,97	0
2	NAG	C	2	14/15	0.96	0.13	71,85,101,109	0
2	NAG	C	1	14/15	0.96	0.13	51,60,67,72	0
4	NAG	G	1	14/15	0.96	0.18	48,58,79,99	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.
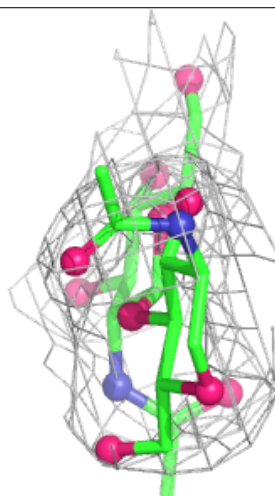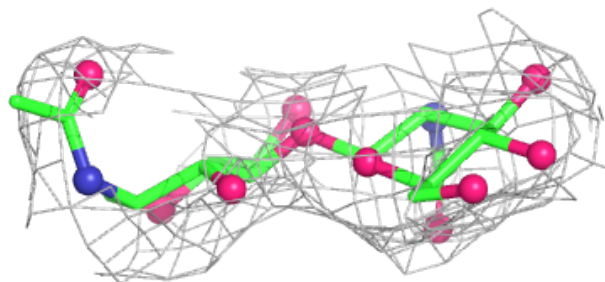
W O R L D W I D E
wwPDB
PROTEIN DATA BANK

Electron density around Chain C:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
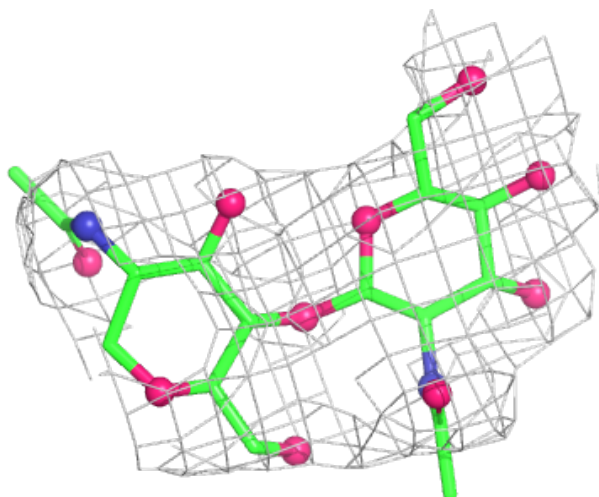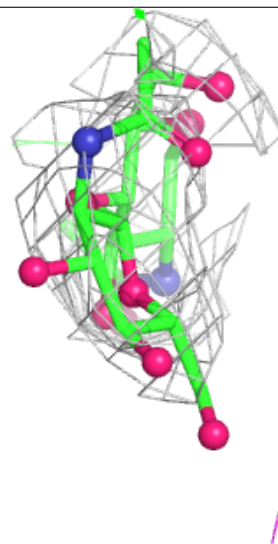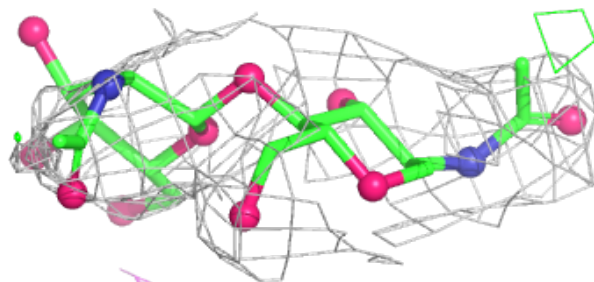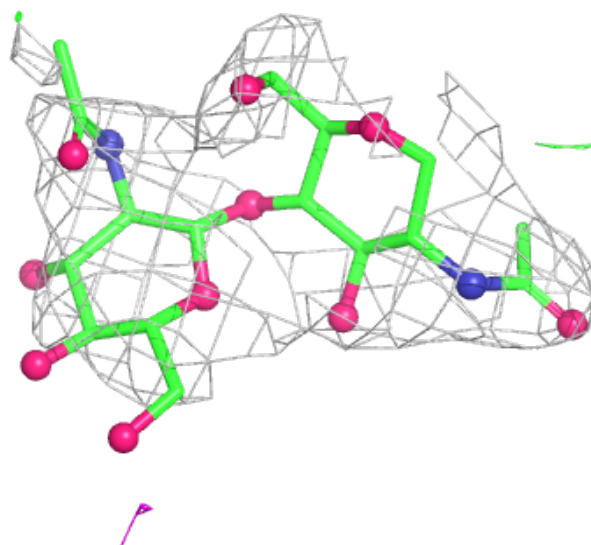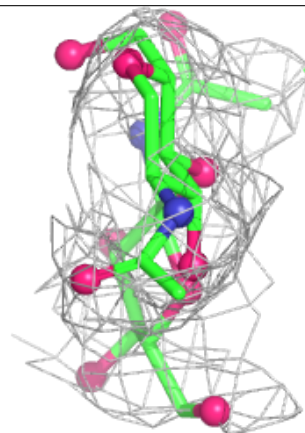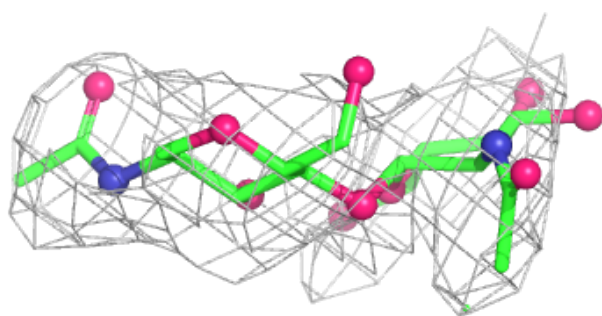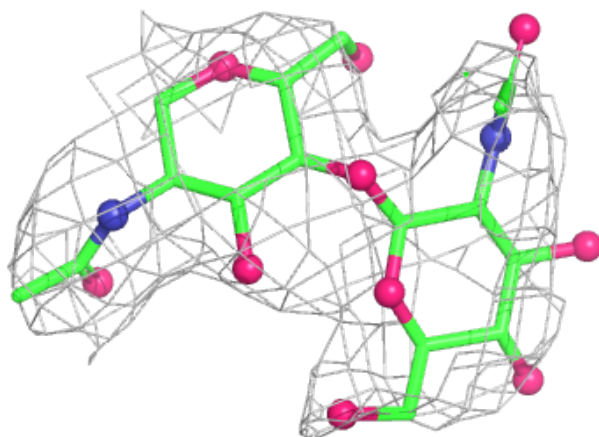mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
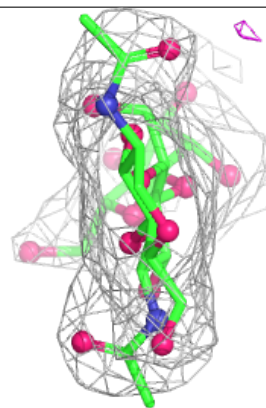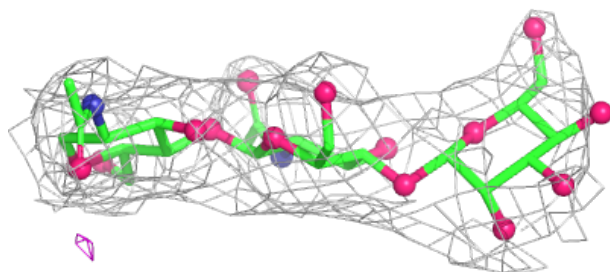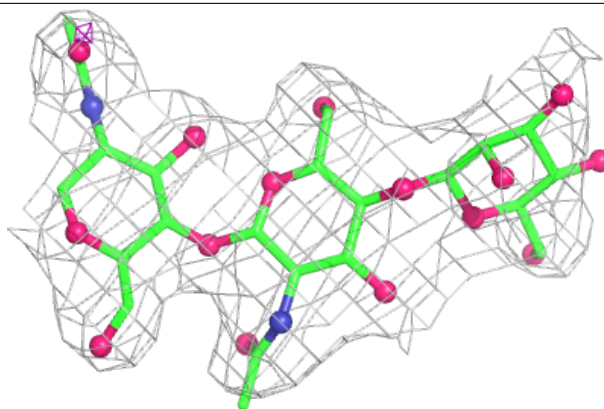
Electron density around Chain D:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
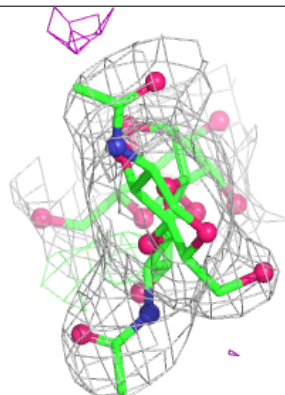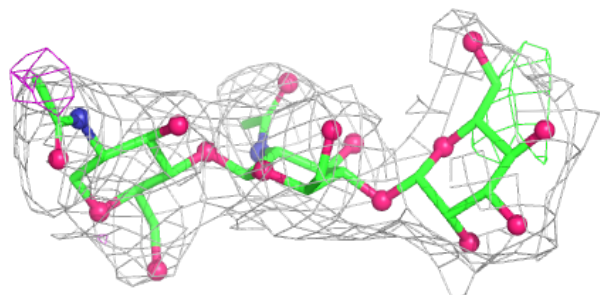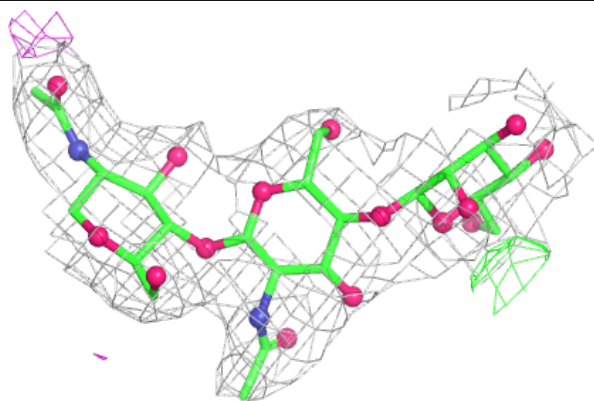
Electron density around Chain E:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
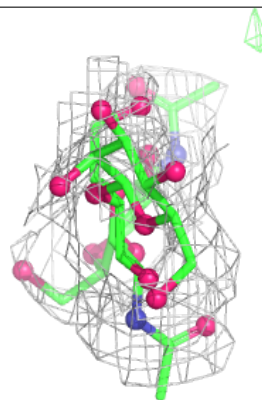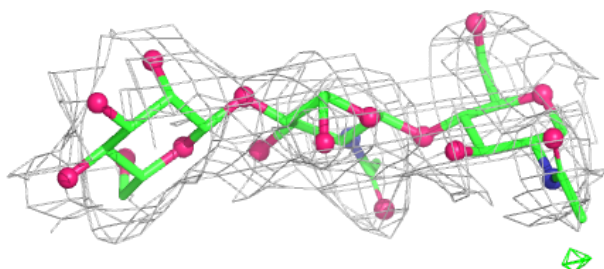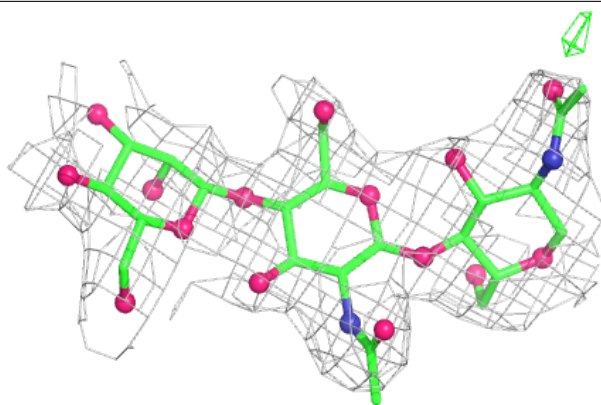
Electron density around Chain F:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
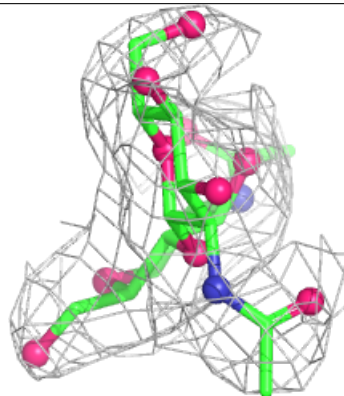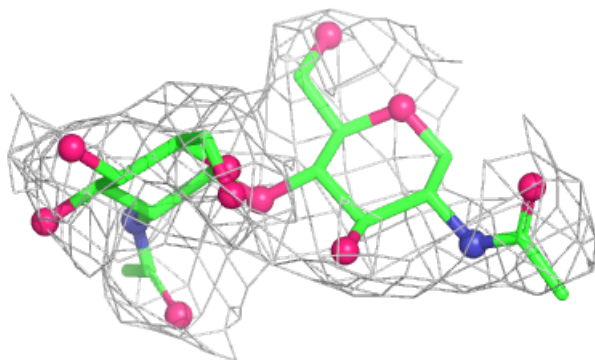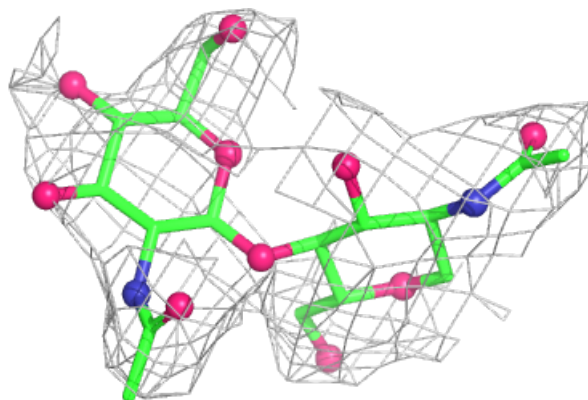
Electron density around Chain H:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
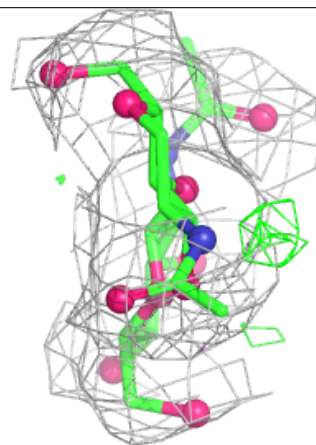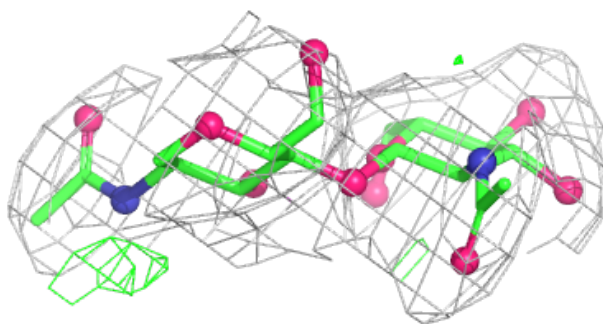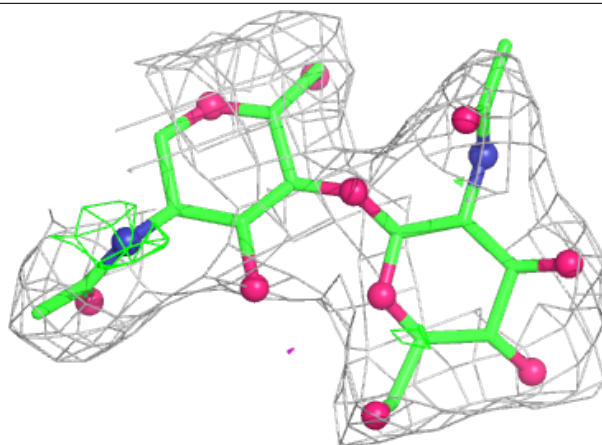
Electron density around Chain I:

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

Electron density around Chain J:

$2mF_o$-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 K:

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)
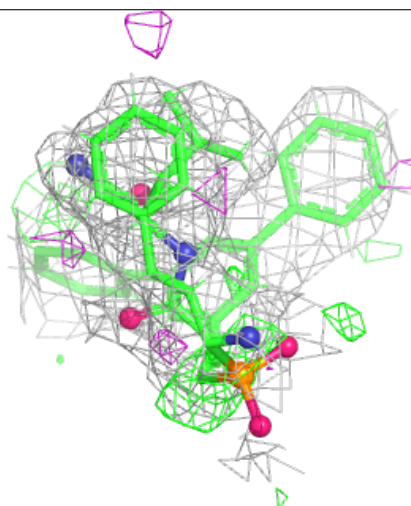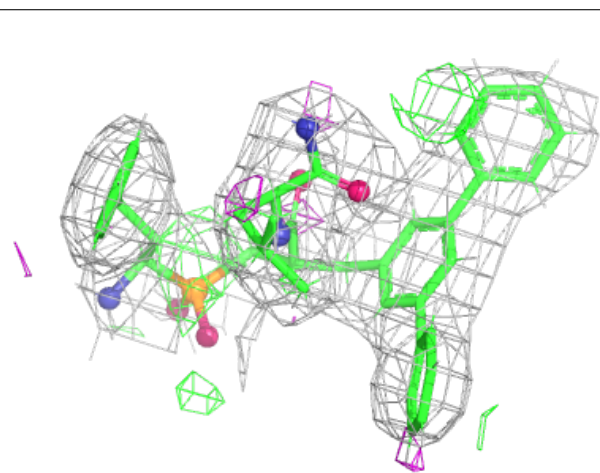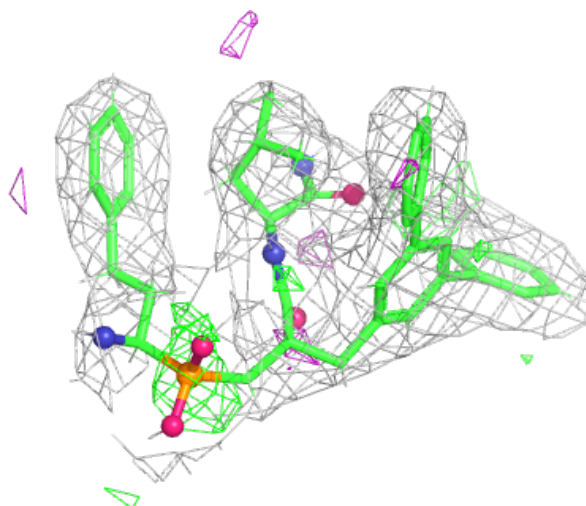and green (positive)
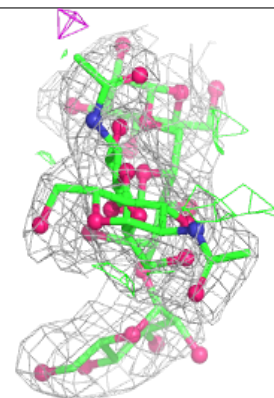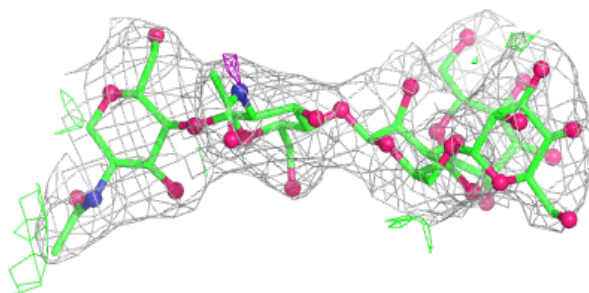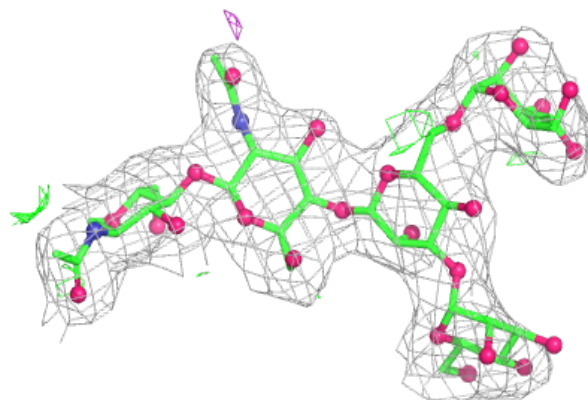
6.4 Ligands (i)

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.
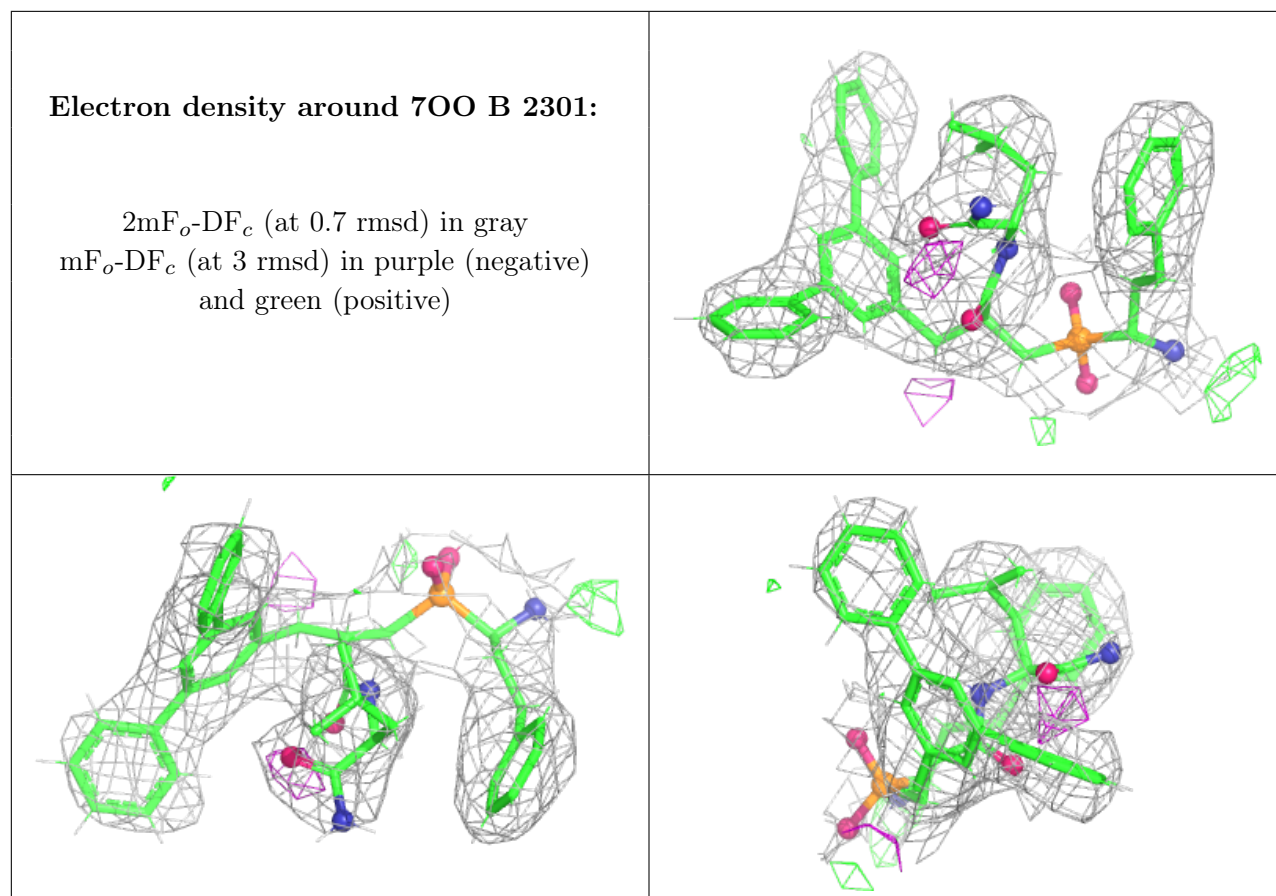
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	NAG	B	2304	14/15	0.58	0.27	138,158,168,168	0
5	NAG	B	2303	14/15	0.71	0.36	130,148,163,167	0
5	NAG	B	2302	14/15	0.71	0.19	160,166,174,175	0
5	NAG	A	1004	14/15	0.72	0.28	128,144,149,149	0
5	NAG	A	1005	14/15	0.73	0.27	106,127,136,138	0
5	NAG	A	1002	14/15	0.80	0.16	131,140,149,152	0
5	NAG	A	1003	14/15	0.86	0.19	116,159,174,176	0
5	NAG	A	1001	14/15	0.86	0.14	121,131,137,140	0
7	EDO	A	1007	4/4	0.88	0.38	103,106,106,107	0
7	EDO	A	1008	4/4	0.90	0.18	91,95,96,96	0
8	IMD	A	1010	5/5	0.91	0.20	107,107,108,110	0
7	EDO	A	1009	4/4	0.92	0.13	84,91,92,93	0
6	7OO	A	1006	45/45	0.96	0.24	38,69,97,115	0
6	7OO	B	2301	45/45	0.97	0.21	45,80,106,119	0
9	ZN	A	1011	1/1	0.98	0.23	53,53,53,53	0
9	ZN	B	2305	1/1	0.99	0.18	65,65,65,65	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 7OO A 1006:

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

Electron density around 7OO B 2301:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.