WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Nov 2, 2021 – 12:37 PM EDT

PDB ID	:	1J0K
Title	:	Crystal structure of neopullulanase E357Q complex with isopanose
Authors	:	Hondoh, H.; Kuriki, T.; Matsuura, Y.
Deposited on	:	2002-11-14
Resolution	:	3.20 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 following versions of software and data (see references ⓘ) were used in the production of this report:

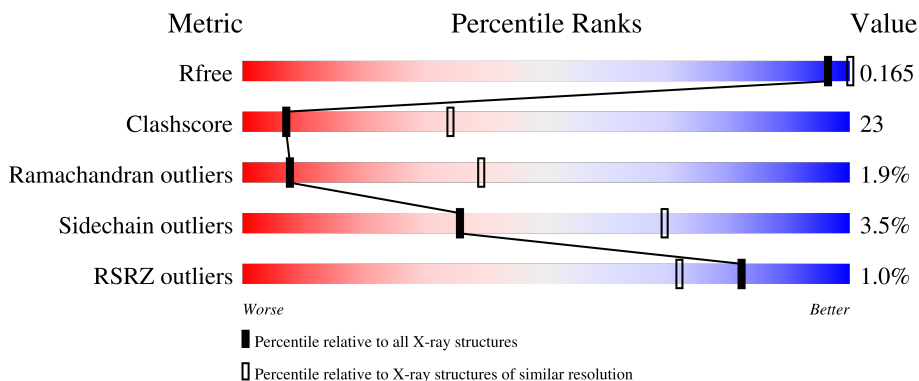|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 3.20 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		0.165
Clashscore		23
Ramachandran outliers		1.9%
Sidechain outliers		3.5%
RSRZ outliers		1.0%

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	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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	588	% 58% 39% •
1	B	588	% 54% 43% •
2	C	3	33% 33% 33%
2	D	3	100%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 9971 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 neopullulanase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	588	Total	C	N	O	S	0	0	0
			4889	3158	817	892	22			
1	B	588	Total	C	N	O	S	0	0	0
			4889	3158	817	892	22			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	290	ALA	ARG	SEE REMARK 999	UNP P38940
A	357	GLN	GLU	engineered mutation	UNP P38940
B	290	ALA	ARG	SEE REMARK 999	UNP P38940
B	357	GLN	GLU	engineered mutation	UNP P38940

- Molecule 2 is an oligosaccharide called alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-6)-alpha-D-glucopyranose.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	C	3	Total	C	O	0	0	0
			34	18	16			
2	D	3	Total	C	O	0	0	0
			34	18	16			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	71	Total	O	0	0
			71	71		

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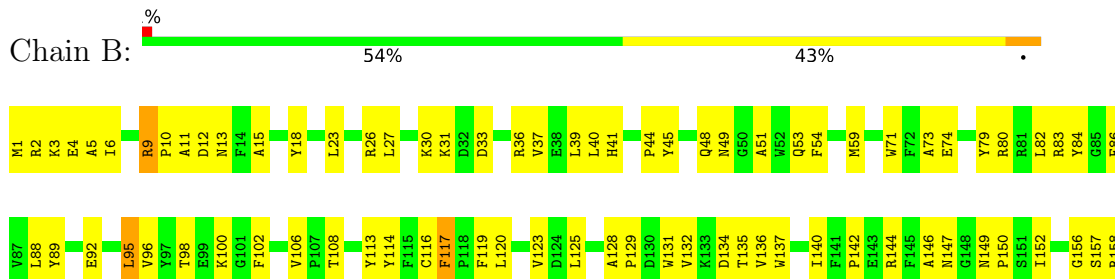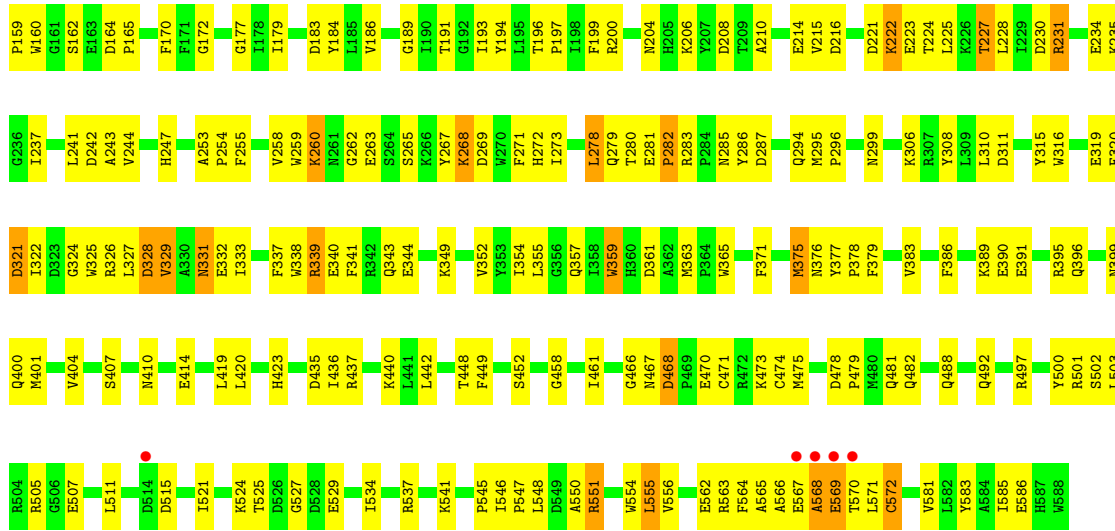| Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	54	Total O 54 54	0	0

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.
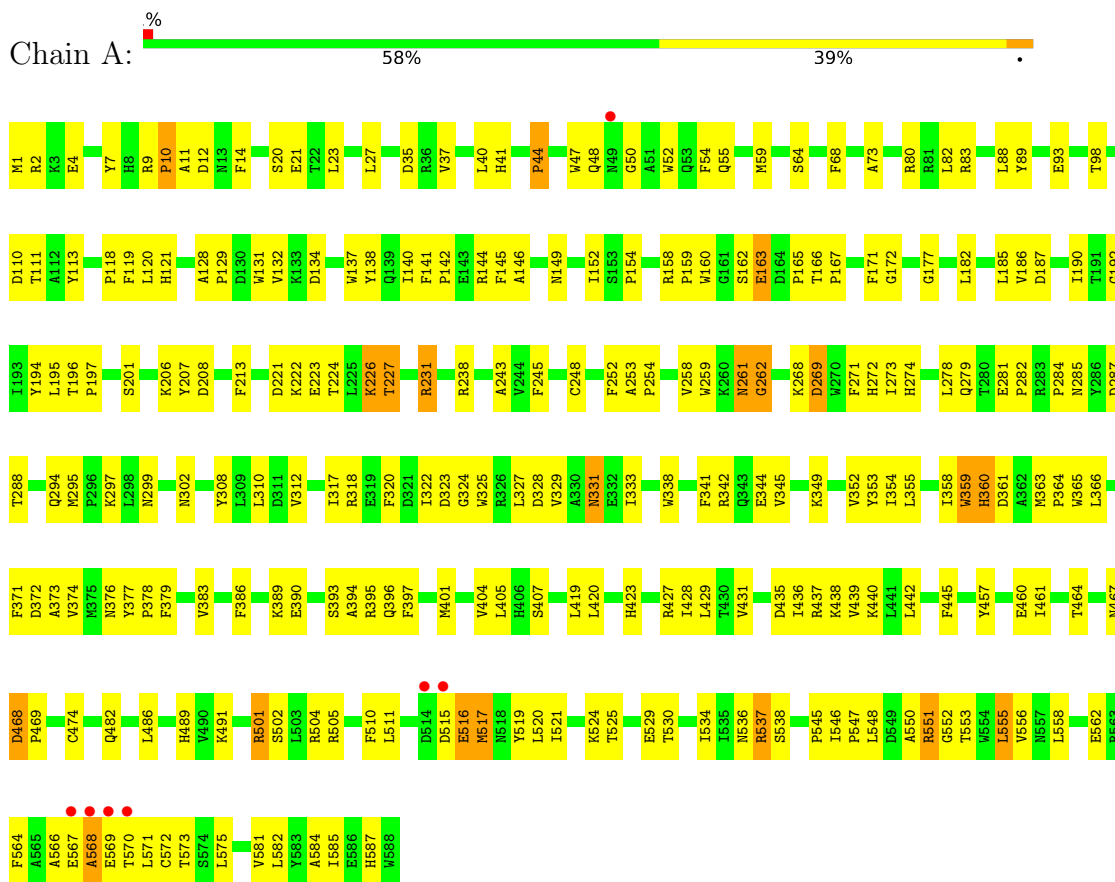
• Molecule 1: neopullulanase

• Molecule 1: neopullulanase

P159 W160 G161 S162 E163 D164 P165 F170 F171 G172 G177 I178 I179 D183 Y184 L185 V186 G189 I190 T191 G192 I193 Y194 L195 T196 P197 I198 F199 R200 N204 H205 K206 Y207 D208 T209 A210 E214 V215 D216 D221 K222 E223 T224 L225 K226 T227 L228 I229 D230 R231 E234 K235

G236 I237 L241 D242 A243 V244 H247 A253 P254 F255 V258 W259 K260 N261 G262 E263 S264 S265 K266 Y267 K268 D269 W270 F271 H272 I273 L278 Q279 T280 E281 P282 R283 P284 N285 Y286 D287 Q294 M295 P296 N299 K306 R307 Y308 L309 L310 D311 Y315 W316 E319 F320

D321 I322 D323 G324 W325 R326 L327 D328 V329 A330 N331 E332 I333 F337 W338 R339 E340 F341 R342 Q343 E344 K349 V352 Y353 I354 L355 G356 Q357 I358 W359 H360 D361 A362 M363 P364 W365 F371 M375 N376 Y377 P378 F379 V383 F386 K389 E390 E391 R395 Q396 N399

Q400 M401 V404 S407 N410 E414 L419 L420 H423 D435 I436 R437 K440 L441 L442 T448 F449 S452 G458 I461 G466 N467 D468 P469 E470 C471 R472 K473 C474 M475 D478 P479 M480 Q481 Q482 Q488 Q492 R497 Y500 R501 S502 L503

R504 R505 G506 E507 L511 D514 D515 I521 K524 T525 D526 G527 D528 E529 I534 R537 K541 P545 I546 P547 L548 D549 A550 R551 W554 L555 V556 E562 R563 F564 A565 A566 E567 A568 E569 T570 L571 C572 V581 L582 Y583 A584 I585 E586 H587 W588

- Molecule 2: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-6)-alpha-D-glucopyranose

Chain C:

33% 33% 33%

GLC1 GLC2 GLC3

- Molecule 2: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose-(1-6)-alpha-D-glucopyranose

Chain D:

100%

GLC1 GLC2 GLC3

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	68.01Å 73.76Å 123.25Å 90.00° 90.15° 90.00°	Depositor
Resolution (Å)	10.00 – 3.20 19.98 – 3.20	Depositor EDS
% Data completeness (in resolution range)	(Not available) (10.00-3.20) 100.0 (19.98-3.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.17 (at 3.22Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.174 , 0.212 0.174 , 0.165	Depositor DCC
R_{free} test set	1037 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å^2)	36.4	Xtriage
Anisotropy	0.265	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 48.5	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.022 for h,-k,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	9971	wwPDB-VP
Average B, all atoms (Å^2)	16.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.96% 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: GLC

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	0.43	0/5047	0.66	0/6857
1	B	0.43	0/5047	0.66	1/6857 (0.0%)
All	All	0.43	0/10094	0.66	1/13714 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	117	PHE	N-CA-C	-5.75	95.48	111.00

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	4889	0	4645	203	0
1	B	4889	0	4645	240	0
2	C	34	0	30	2	0
2	D	34	0	30	2	0
3	A	71	0	0	3	0
3	B	54	0	0	2	0
All	All	9971	0	9350	433	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 23.

All (433) 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:2:ARG:HH21	1:B:4:GLU:HB2	1.19	1.02
1:B:253:ALA:HB3	1:B:254:PRO:HD3	1.49	0.94
1:B:545:PRO:HA	1:B:572:CYS:HB2	1.55	0.89
1:A:23:LEU:HD23	1:A:120:LEU:HD21	1.55	0.88
1:A:2:ARG:NH2	1:B:4:GLU:HB2	1.91	0.86
1:A:393:SER:OG	1:A:396:GLN:HG3	1.76	0.84
1:A:159:PRO:HG2	1:A:162:SER:HB2	1.59	0.84
1:A:429:LEU:HD23	1:A:464:THR:HG22	1.59	0.84
1:A:41:HIS:HB2	1:A:82:LEU:HD11	1.61	0.82
1:B:147:ASN:HD21	1:B:150:PRO:HG3	1.46	0.81
1:A:201:SER:HB3	1:A:206:LYS:HG3	1.61	0.80
1:A:44:PRO:HG3	1:A:83:ARG:HG2	1.62	0.80
1:A:501:ARG:HD2	1:A:505:ARG:HD2	1.64	0.78
1:B:41:HIS:HB2	1:B:82:LEU:HD11	1.67	0.77
1:A:511:LEU:HD23	1:A:547:PRO:HG2	1.66	0.77
1:B:149:ASN:OD1	1:B:152:ILE:HG12	1.86	0.76
1:B:400:GLN:O	1:B:404:VAL:HG13	1.85	0.76
1:A:2:ARG:HH21	1:B:4:GLU:CB	1.98	0.75
1:B:3:LYS:HA	1:B:6:ILE:HD12	1.69	0.75
1:B:222:LYS:HG3	1:B:320:PHE:HZ	1.52	0.74
1:A:389:LYS:HE2	1:A:431:VAL:HG13	1.69	0.74
1:A:429:LEU:HD23	1:A:464:THR:CG2	2.18	0.73
1:B:328:ASP:HA	1:B:357:GLN:HB3	1.71	0.73
1:A:558:LEU:HD21	1:A:584:ALA:HB2	1.70	0.72
1:B:326:ARG:HE	1:B:375:MET:CE	2.03	0.72
1:B:326:ARG:HE	1:B:375:MET:HE3	1.54	0.72
1:A:47:TRP:HZ2	1:A:111:THR:HG23	1.54	0.72
1:B:389:LYS:HB3	1:B:391:GLU:HG3	1.73	0.71
1:B:310:LEU:HD13	1:B:344:GLU:OE2	1.91	0.70
1:A:440:LYS:HG2	1:A:489:HIS:CE1	2.27	0.69
1:A:349:LYS:O	1:A:352:VAL:HG23	1.92	0.69
1:A:299:ASN:ND2	1:A:302:ASN:HB2	2.07	0.69
1:B:420:LEU:HD13	1:B:442:LEU:HB3	1.75	0.69
1:A:359:TRP:HA	1:A:377:TYR:HD1	1.57	0.69
1:B:551:ARG:HE	1:B:551:ARG:HA	1.59	0.68
1:B:331:ASN:N	1:B:331:ASN:HD22	1.91	0.68
1:B:567:GLU:C	1:B:569:GLU:H	1.96	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:59:MET:HG2	1:A:73:ALA:HB2	1.76	0.67
1:B:326:ARG:NH1	1:B:328:ASP:HB3	2.10	0.67
1:B:12:ASP:HB3	1:B:363:MET:SD	2.34	0.67
1:B:511:LEU:HB2	1:B:521:ILE:HG22	1.75	0.67
1:B:315:TYR:CE1	1:B:319:GLU:HG3	2.29	0.67
1:B:247:HIS:CD2	1:B:295:MET:HB3	2.30	0.66
1:A:279:GLN:O	1:A:284:PRO:HA	1.94	0.66
1:A:390:GLU:HG2	1:A:537:ARG:HD3	1.78	0.66
1:A:331:ASN:HD22	1:A:331:ASN:N	1.93	0.66
1:A:144:ARG:HH21	1:A:165:PRO:HB2	1.61	0.66
1:A:551:ARG:HE	1:A:551:ARG:HA	1.61	0.66
1:B:1:MET:HA	1:B:33:ASP:OD2	1.95	0.66
1:B:88:LEU:N	1:B:88:LEU:HD12	2.11	0.65
1:B:221:ASP:OD1	1:B:223:GLU:HB3	1.96	0.65
1:B:282:PRO:HG2	1:B:283:ARG:H	1.61	0.65
1:A:129:PRO:O	1:A:132:VAL:HG22	1.96	0.65
1:B:525:THR:HG22	1:B:527:GLY:H	1.61	0.65
1:A:435:ASP:OD1	1:A:437:ARG:HB2	1.97	0.65
1:B:160:TRP:CE2	1:B:474:CYS:HB3	2.33	0.64
1:A:272:HIS:HB2	1:A:287:ASP:HB2	1.80	0.64
1:B:1:MET:HG2	1:B:95:LEU:HD12	1.79	0.64
1:A:47:TRP:CZ2	1:A:52:TRP:HB2	2.32	0.64
1:B:39:LEU:HD11	1:B:84:TYR:HB2	1.80	0.63
1:A:226:LYS:HE2	1:A:226:LYS:HA	1.79	0.63
1:A:525:THR:HG22	1:A:530:THR:HG23	1.81	0.63
1:B:563:ARG:NH2	1:B:586:GLU:OE1	2.32	0.63
1:A:359:TRP:HA	1:A:377:TYR:CD1	2.33	0.63
1:B:23:LEU:HB3	1:B:120:LEU:HD21	1.80	0.63
1:B:357:GLN:OE1	2:D:1:GLC:H62	1.99	0.63
1:A:546:ILE:O	1:A:570:THR:HB	1.99	0.62
1:A:327:LEU:HD11	1:A:341:PHE:CZ	2.34	0.62
1:A:427:ARG:O	1:A:431:VAL:HG23	1.99	0.62
1:B:96:VAL:O	1:B:102:PHE:HA	1.99	0.62
1:B:329:VAL:HG22	2:D:1:GLC:H61	1.80	0.62
1:B:521:ILE:HG12	1:B:534:ILE:HG12	1.80	0.62
1:A:132:VAL:HG11	1:A:353:TYR:CD1	2.35	0.62
1:B:511:LEU:HD23	1:B:547:PRO:HG2	1.81	0.62
1:A:166:THR:HB	1:A:167:PRO:HD2	1.81	0.62
1:A:253:ALA:HB3	1:A:254:PRO:HD3	1.82	0.62
1:A:299:ASN:HD22	1:A:302:ASN:HB2	1.66	0.61
1:A:119:PHE:CD2	1:A:121:HIS:CE1	2.89	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:326:ARG:NH1	1:B:328:ASP:OD2	2.34	0.60
1:B:339:ARG:HG3	1:B:339:ARG:HH11	1.66	0.60
1:B:502:SER:HB3	1:B:529:GLU:HG3	1.82	0.60
1:A:269:ASP:HB3	1:A:302:ASN:ND2	2.17	0.60
1:B:547:PRO:O	1:B:548:LEU:HD12	2.02	0.60
1:B:74:GLU:O	1:B:74:GLU:HG3	2.01	0.60
1:A:515:ASP:C	1:A:517:MET:H	2.05	0.60
1:B:254:PRO:O	1:B:258:VAL:HG23	2.02	0.60
1:A:243:ALA:HB2	1:A:325:TRP:CE3	2.36	0.60
1:B:333:ILE:HD12	1:B:338:TRP:CZ2	2.37	0.59
1:A:461:ILE:HB	1:A:482:GLN:HB2	1.84	0.59
1:A:555:LEU:N	1:A:555:LEU:HD22	2.17	0.59
1:A:47:TRP:CZ2	1:A:111:THR:HG23	2.37	0.59
1:B:147:ASN:ND2	1:B:150:PRO:HG3	2.15	0.59
1:A:317:ILE:HA	1:A:322:ILE:HG12	1.84	0.59
1:A:226:LYS:HE3	1:A:320:PHE:HA	1.85	0.59
1:A:331:ASN:HD22	1:A:331:ASN:H	1.50	0.58
1:B:197:PRO:HB2	1:B:206:LYS:HB2	1.86	0.58
1:A:269:ASP:HB3	1:A:302:ASN:HD22	1.68	0.58
1:A:223:GLU:O	1:A:227:THR:HG22	2.04	0.58
1:B:223:GLU:O	1:B:227:THR:HG22	2.03	0.58
1:A:376:ASN:O	1:A:379:PHE:HB3	2.04	0.58
1:B:123:VAL:HG13	3:B:1082:HOH:O	2.02	0.58
1:B:222:LYS:HG3	1:B:320:PHE:CZ	2.36	0.58
1:B:306:LYS:HG3	1:B:337:PHE:HD2	1.69	0.58
1:A:502:SER:HB3	1:A:529:GLU:HB3	1.85	0.58
1:B:134:ASP:CG	1:B:505:ARG:HH21	2.07	0.57
1:A:331:ASN:HB3	1:A:358:ILE:HG12	1.86	0.57
1:A:390:GLU:OE1	1:A:438:LYS:HE3	2.04	0.57
1:A:556:VAL:HB	1:A:584:ALA:HB3	1.86	0.57
1:B:554:TRP:CD2	1:B:565:ALA:HB2	2.40	0.57
1:A:64:SER:HB2	1:A:68:PHE:O	2.04	0.57
1:A:207:TYR:HB3	2:C:2:GLC:O6	2.05	0.57
1:B:349:LYS:HG2	1:B:352:VAL:HG23	1.87	0.57
1:A:536:ASN:O	1:A:538:SER:N	2.37	0.57
1:A:383:VAL:HG12	1:A:442:LEU:HD22	1.87	0.56
1:B:479:PRO:HA	1:B:482:GLN:HG2	1.87	0.56
1:B:419:LEU:HD23	1:B:419:LEU:H	1.70	0.56
1:B:488:GLN:O	1:B:492:GLN:HB2	2.05	0.56
1:B:449:PHE:O	1:B:497:ARG:NH2	2.37	0.56
1:A:404:VAL:HG13	1:A:405:LEU:N	2.21	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:383:VAL:HG12	1:B:442:LEU:HD22	1.88	0.56
1:A:2:ARG:NH1	1:B:2:ARG:HE	2.03	0.56
1:B:383:VAL:HG12	1:B:442:LEU:CD2	2.35	0.56
1:A:342:ARG:NH2	1:A:372:ASP:OD1	2.39	0.56
1:A:345:VAL:HG11	1:A:354:ILE:HD11	1.87	0.55
1:A:355:LEU:HD12	1:A:373:ALA:O	2.07	0.55
1:B:196:THR:HB	1:B:197:PRO:HD2	1.88	0.55
1:B:448:THR:HG22	1:B:503:LEU:HD22	1.89	0.55
1:A:333:ILE:HD12	1:A:338:TRP:CZ2	2.42	0.55
1:B:140:ILE:O	1:B:142:PRO:HD3	2.07	0.55
1:A:23:LEU:HD12	1:A:23:LEU:C	2.28	0.55
1:A:366:LEU:HD21	1:A:374:VAL:HG13	1.88	0.55
1:B:327:LEU:HD22	1:B:338:TRP:CH2	2.42	0.55
1:B:410:ASN:O	1:B:414:GLU:HG3	2.07	0.55
1:A:297:LYS:HE2	1:B:119:PHE:CZ	2.41	0.54
1:A:395:ARG:HB2	1:A:516:GLU:HG3	1.89	0.54
1:B:48:GLN:HG2	1:B:53:GLN:CD	2.28	0.54
1:B:279:GLN:N	1:B:285:ASN:OD1	2.34	0.54
1:B:258:VAL:HA	1:B:265:SER:CB	2.37	0.54
1:A:149:ASN:ND2	1:A:152:ILE:HG12	2.22	0.54
1:B:278:LEU:HA	1:B:285:ASN:HD21	1.72	0.54
1:B:461:ILE:HB	1:B:482:GLN:HB2	1.90	0.54
1:B:545:PRO:CA	1:B:572:CYS:HB2	2.33	0.54
1:A:521:ILE:HG23	1:A:534:ILE:HG12	1.89	0.54
1:A:227:THR:O	1:A:231:ARG:HB2	2.08	0.54
1:B:306:LYS:HG3	1:B:337:PHE:CD2	2.42	0.54
1:B:326:ARG:HH12	1:B:328:ASP:HB3	1.72	0.54
1:A:140:ILE:HB	1:A:195:LEU:HD23	1.90	0.54
1:A:359:TRP:O	1:A:360:HIS:HB3	2.08	0.54
1:B:44:PRO:HG3	1:B:83:ARG:HG2	1.89	0.54
1:B:253:ALA:HB3	1:B:254:PRO:CD	2.32	0.54
1:A:460:GLU:HG2	1:A:461:ILE:HG23	1.90	0.54
1:B:146:ALA:O	1:B:177:GLY:HA3	2.07	0.54
1:A:2:ARG:CZ	1:B:2:ARG:HE	2.21	0.53
1:B:555:LEU:HD12	1:B:564:PHE:CZ	2.44	0.53
1:A:341:PHE:CE2	1:A:354:ILE:HD13	2.43	0.53
1:A:273:ILE:HD13	1:A:278:LEU:HD11	1.89	0.53
1:B:546:ILE:O	1:B:546:ILE:HG13	2.07	0.53
1:A:137:TRP:HA	1:A:192:GLY:O	2.08	0.53
1:A:278:LEU:O	1:A:279:GLN:HG2	2.09	0.53
1:A:327:LEU:HD22	1:A:338:TRP:CZ3	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:555:LEU:HD22	1:B:585:ILE:HD12	1.90	0.53
1:A:308:TYR:O	1:A:312:VAL:HG23	2.09	0.53
1:A:354:ILE:HG22	1:A:371:PHE:HD1	1.74	0.53
1:A:23:LEU:HD12	1:A:23:LEU:O	2.08	0.52
1:A:243:ALA:HB2	1:A:325:TRP:CZ3	2.44	0.52
1:B:554:TRP:CE3	1:B:565:ALA:HB2	2.44	0.52
1:A:35:ASP:HB2	1:A:89:TYR:O	2.09	0.52
1:B:134:ASP:OD2	1:B:505:ARG:NH2	2.42	0.52
1:A:138:TYR:CZ	1:A:457:TYR:HA	2.45	0.52
1:A:467:ASN:O	1:A:468:ASP:C	2.48	0.52
1:B:273:ILE:HD13	1:B:278:LEU:HD11	1.91	0.52
1:A:468:ASP:OD2	1:A:469:PRO:HA	2.10	0.52
1:A:138:TYR:HB2	1:A:190:ILE:HD12	1.91	0.52
1:A:328:ASP:OD2	1:A:329:VAL:HG23	2.10	0.52
1:B:159:PRO:HB2	1:B:162:SER:HB2	1.91	0.52
1:B:244:VAL:HG22	1:B:328:ASP:OD1	2.09	0.52
1:A:568:ALA:HB3	1:A:569:GLU:OE2	2.11	0.51
1:A:324:GLY:HA2	1:A:352:VAL:HG13	1.92	0.51
1:A:134:ASP:OD1	1:A:504:ARG:HD2	2.10	0.51
1:B:225:LEU:O	1:B:228:LEU:HB3	2.10	0.51
1:B:258:VAL:HA	1:B:265:SER:HB2	1.92	0.51
1:A:567:GLU:OE2	1:A:571:LEU:HD21	2.10	0.51
1:B:501:ARG:NH1	1:B:505:ARG:HD2	2.25	0.51
1:B:562:GLU:HG2	1:B:563:ARG:N	2.26	0.51
1:A:2:ARG:NH1	1:A:4:GLU:HG3	2.24	0.51
1:B:100:LYS:HG3	1:B:113:TYR:HA	1.92	0.51
1:B:197:PRO:HD3	1:B:242:ASP:OD1	2.11	0.51
1:B:227:THR:O	1:B:231:ARG:HB2	2.10	0.51
1:B:243:ALA:HB2	1:B:325:TRP:CE3	2.45	0.51
1:A:460:GLU:OE2	1:A:460:GLU:N	2.37	0.51
1:B:507:GLU:O	1:B:524:LYS:HA	2.11	0.51
1:B:546:ILE:HG12	1:B:571:LEU:O	2.11	0.51
1:A:419:LEU:HD23	1:A:419:LEU:H	1.75	0.50
1:B:379:PHE:O	1:B:383:VAL:HG23	2.11	0.50
1:A:259:TRP:CD1	1:A:259:TRP:O	2.64	0.50
1:B:31:LYS:NZ	1:B:395:ARG:NH1	2.60	0.50
1:B:253:ALA:CB	1:B:254:PRO:HD3	2.31	0.50
1:B:571:LEU:HD22	1:B:571:LEU:N	2.27	0.50
1:B:339:ARG:HG3	1:B:339:ARG:NH1	2.27	0.50
1:A:310:LEU:HD22	1:A:344:GLU:HG3	1.94	0.49
1:A:502:SER:HB3	1:A:529:GLU:CB	2.41	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:404:VAL:HG13	1:A:405:LEU:H	1.76	0.49
1:B:550:ALA:HB1	1:B:566:ALA:O	2.13	0.49
1:A:27:LEU:HD23	1:A:37:VAL:HG11	1.94	0.49
1:A:149:ASN:HD22	1:A:152:ILE:HG12	1.76	0.49
1:A:238:ARG:HA	1:A:323:ASP:OD1	2.12	0.49
1:B:10:PRO:HA	1:B:15:ALA:HB3	1.95	0.49
1:B:386:PHE:CZ	1:B:537:ARG:HD3	2.48	0.49
1:A:515:ASP:HB3	1:A:519:TYR:CD1	2.48	0.49
1:B:200:ARG:O	1:B:210:ALA:HB3	2.13	0.49
1:B:230:ASP:O	1:B:234:GLU:HG2	2.13	0.49
1:A:397:PHE:O	1:A:401:MET:HG2	2.12	0.49
1:A:510:PHE:CD2	1:A:520:LEU:HD11	2.48	0.49
1:A:2:ARG:NH1	1:A:4:GLU:CG	2.76	0.48
1:A:171:PHE:CD2	1:A:474:CYS:SG	3.06	0.48
1:A:279:GLN:HB2	1:A:285:ASN:ND2	2.28	0.48
1:A:182:LEU:O	1:A:186:VAL:HG23	2.13	0.48
1:A:146:ALA:O	1:A:177:GLY:HA3	2.13	0.48
1:A:224:THR:O	1:A:227:THR:HG23	2.13	0.48
1:B:80:ARG:O	1:B:119:PHE:HA	2.13	0.48
1:A:389:LYS:HE2	1:A:431:VAL:CG1	2.41	0.48
1:A:144:ARG:HH21	1:A:165:PRO:CB	2.26	0.48
1:A:420:LEU:HD13	1:A:442:LEU:HB3	1.95	0.48
1:B:158:ARG:HA	1:B:158:ARG:NE	2.28	0.48
1:B:196:THR:HB	1:B:197:PRO:CD	2.44	0.48
1:A:185:LEU:HD22	1:A:190:ILE:HG13	1.95	0.48
1:B:466:GLY:H	1:B:470:GLU:CG	2.27	0.48
1:B:128:ALA:O	1:B:129:PRO:C	2.51	0.48
1:B:326:ARG:NE	1:B:375:MET:CE	2.75	0.48
1:B:354:ILE:HG22	1:B:371:PHE:HD1	1.79	0.48
1:B:551:ARG:HH12	1:B:568:ALA:HA	1.79	0.48
1:A:281:GLU:HA	1:A:282:PRO:C	2.34	0.48
1:A:98:THR:HB	1:A:113:TYR:O	2.13	0.48
1:B:45:TYR:N	1:B:45:TYR:CD1	2.81	0.48
1:A:187:ASP:O	1:A:491:LYS:NZ	2.46	0.47
1:B:281:GLU:HA	1:B:282:PRO:C	2.34	0.47
1:B:556:VAL:O	1:B:583:TYR:HA	2.13	0.47
1:B:567:GLU:C	1:B:569:GLU:N	2.66	0.47
1:A:272:HIS:CD2	1:A:297:LYS:HD3	2.49	0.47
1:A:440:LYS:HG2	1:A:489:HIS:NE2	2.29	0.47
1:B:554:TRP:C	1:B:555:LEU:HD23	2.35	0.47
1:A:47:TRP:CE2	1:A:52:TRP:HB2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:154:PRO:HD2	1:A:172:GLY:HA2	1.95	0.47
1:B:377:TYR:N	1:B:378:PRO:CD	2.78	0.47
1:A:10:PRO:O	1:A:11:ALA:HB2	2.15	0.47
1:B:135:THR:CG2	1:B:136:VAL:N	2.77	0.47
1:B:199:PHE:HA	1:B:214:GLU:O	2.15	0.47
1:B:467:ASN:O	1:B:468:ASP:C	2.53	0.47
1:B:129:PRO:O	1:B:132:VAL:HG22	2.15	0.47
1:B:268:LYS:HD3	1:B:269:ASP:N	2.29	0.47
1:A:145:PHE:HB3	3:A:1107:HOH:O	2.14	0.47
1:B:98:THR:HB	1:B:113:TYR:O	2.15	0.47
1:A:40:LEU:HG	1:A:54:PHE:CD2	2.50	0.47
1:A:110:ASP:OD1	1:A:111:THR:N	2.48	0.47
1:B:331:ASN:N	1:B:331:ASN:ND2	2.62	0.47
1:B:376:ASN:OD1	1:B:378:PRO:HD2	2.15	0.47
1:B:461:ILE:HB	1:B:482:GLN:CB	2.45	0.47
1:B:563:ARG:O	1:B:564:PHE:HB3	2.14	0.47
1:B:165:PRO:HG3	1:B:473:LYS:HA	1.97	0.47
1:B:82:LEU:HG	1:B:83:ARG:N	2.30	0.47
1:B:247:HIS:HD2	1:B:295:MET:HB3	1.78	0.47
1:A:365:TRP:HB3	1:A:371:PHE:HD2	1.80	0.47
1:B:221:ASP:OD1	1:B:224:THR:N	2.43	0.46
1:B:339:ARG:O	1:B:343:GLN:HG3	2.15	0.46
1:B:395:ARG:HD2	1:B:399:ASN:ND2	2.30	0.46
1:B:545:PRO:HA	1:B:572:CYS:CB	2.37	0.46
1:A:158:ARG:NH1	1:A:163:GLU:OE2	2.48	0.46
1:A:272:HIS:HB3	1:A:287:ASP:OD2	2.15	0.46
1:A:288:THR:HB	1:A:295:MET:O	2.14	0.46
1:A:329:VAL:HG12	1:A:329:VAL:O	2.15	0.46
1:A:429:LEU:HA	1:A:439:VAL:CG2	2.46	0.46
1:A:555:LEU:CD1	1:A:585:ILE:HD12	2.45	0.46
1:B:10:PRO:O	1:B:11:ALA:HB2	2.16	0.46
1:B:272:HIS:HE2	1:B:299:ASN:HA	1.81	0.46
1:B:13:ASN:HB3	1:B:407:SER:O	2.16	0.46
1:B:478:ASP:OD2	1:B:481:GLN:NE2	2.48	0.46
1:A:4:GLU:HB2	1:B:5:ALA:HB2	1.97	0.46
1:A:7:TYR:O	1:A:27:LEU:HD12	2.16	0.46
1:B:423:HIS:O	1:B:471:CYS:SG	2.74	0.46
1:B:331:ASN:ND2	1:B:332:GLU:HG3	2.31	0.46
1:A:327:LEU:HD22	1:A:338:TRP:CH2	2.52	0.45
1:B:9:ARG:HA	1:B:10:PRO:HD3	1.71	0.45
1:B:555:LEU:HD22	1:B:585:ILE:CD1	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:196:THR:HB	1:A:197:PRO:HD2	1.98	0.45
1:A:252:PHE:CD2	1:A:254:PRO:HD2	2.51	0.45
1:B:324:GLY:HA2	1:B:352:VAL:HG13	1.97	0.45
1:B:349:LYS:CG	1:B:352:VAL:HG23	2.46	0.45
1:B:376:ASN:ND2	1:B:379:PHE:HB2	2.32	0.45
1:B:259:TRP:HA	1:B:278:LEU:HD22	1.98	0.45
1:B:294:GLN:CD	1:B:294:GLN:H	2.20	0.45
1:A:274:HIS:CD2	3:A:1036:HOH:O	2.69	0.45
1:B:365:TRP:HB3	1:B:371:PHE:HD2	1.82	0.45
1:B:554:TRP:CE2	1:B:565:ALA:HB2	2.51	0.45
1:A:9:ARG:O	1:A:14:PHE:HB2	2.16	0.45
1:A:11:ALA:O	1:A:12:ASP:C	2.54	0.45
1:B:144:ARG:HG3	1:B:144:ARG:HH11	1.82	0.45
1:B:165:PRO:CG	1:B:473:LYS:HA	2.47	0.45
1:B:401:MET:O	1:B:404:VAL:HG22	2.16	0.45
1:B:534:ILE:CD1	1:B:546:ILE:HG22	2.47	0.45
1:A:360:HIS:O	1:A:361:ASP:C	2.54	0.45
1:A:552:GLY:O	1:A:587:HIS:HA	2.17	0.45
1:B:2:ARG:HG2	1:B:2:ARG:HH11	1.82	0.45
1:B:135:THR:HG22	1:B:136:VAL:N	2.30	0.45
1:A:196:THR:HB	1:A:197:PRO:CD	2.47	0.45
1:B:259:TRP:HH2	1:B:280:THR:HG23	1.82	0.45
1:B:259:TRP:HD1	1:B:260:LYS:HD2	1.82	0.44
1:A:428:ILE:HD12	1:A:439:VAL:HG13	1.99	0.44
1:B:193:ILE:HG13	1:B:237:ILE:HG21	1.98	0.44
1:B:359:TRP:HA	1:B:377:TYR:HD1	1.82	0.44
1:A:2:ARG:HH12	1:A:4:GLU:HG3	1.81	0.44
1:A:548:LEU:HD23	1:A:553:THR:HG21	1.99	0.44
1:A:582:LEU:N	1:A:582:LEU:HD12	2.33	0.44
1:B:551:ARG:HE	1:B:551:ARG:CA	2.28	0.44
1:B:1:MET:CA	1:B:33:ASP:OD2	2.65	0.44
1:A:207:TYR:OH	1:A:423:HIS:NE2	2.50	0.44
1:B:129:PRO:HB2	1:B:131:TRP:NE1	2.32	0.44
1:A:80:ARG:O	1:A:119:PHE:HA	2.17	0.44
1:A:141:PHE:HD2	1:A:144:ARG:HG2	1.82	0.44
1:A:501:ARG:HD2	1:A:505:ARG:CD	2.43	0.44
1:A:261:ASN:O	1:A:262:GLY:C	2.56	0.44
1:B:2:ARG:HD3	1:B:30:LYS:CD	2.48	0.44
1:B:333:ILE:HD12	1:B:338:TRP:HZ2	1.83	0.44
1:A:502:SER:CB	1:A:529:GLU:HB3	2.48	0.44
1:B:27:LEU:HD23	1:B:37:VAL:HG11	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:386:PHE:CE1	1:A:394:ALA:HA	2.53	0.43
1:A:551:ARG:HA	1:A:551:ARG:NE	2.31	0.43
1:A:9:ARG:NE	1:B:361:ASP:OD1	2.41	0.43
1:A:128:ALA:O	1:A:129:PRO:C	2.55	0.43
1:B:18:TYR:O	1:B:125:LEU:HD11	2.19	0.43
1:B:44:PRO:HB2	1:B:45:TYR:CE1	2.52	0.43
1:B:395:ARG:HD2	1:B:399:ASN:HD21	1.83	0.43
1:A:226:LYS:HA	1:A:226:LYS:CE	2.46	0.43
1:A:252:PHE:CG	1:A:254:PRO:HD2	2.52	0.43
1:A:55:GLN:HE21	1:A:55:GLN:HB2	1.63	0.43
1:A:213:PHE:HE1	1:A:308:TYR:CE2	2.35	0.43
1:B:27:LEU:HD22	1:B:86:PHE:CD1	2.54	0.43
1:B:189:GLY:O	1:B:191:THR:HG23	2.18	0.43
1:A:429:LEU:HA	1:A:439:VAL:HG21	2.01	0.43
1:B:79:TYR:HB3	3:B:1113:HOH:O	2.19	0.43
1:B:436:ILE:O	1:B:440:LYS:HG3	2.18	0.43
1:B:88:LEU:N	1:B:88:LEU:CD1	2.81	0.43
1:B:137:TRP:NE1	1:B:452:SER:OG	2.51	0.43
1:B:320:PHE:O	1:B:321:ASP:CB	2.66	0.43
1:B:461:ILE:HD11	1:B:475:MET:SD	2.58	0.43
1:A:4:GLU:CD	1:A:4:GLU:H	2.22	0.43
1:A:149:ASN:HD21	1:A:152:ILE:HG23	1.84	0.43
1:B:186:VAL:HG21	1:B:235:LYS:HD3	2.00	0.43
1:B:326:ARG:HG2	1:B:355:LEU:HD23	2.00	0.43
1:B:435:ASP:OD1	1:B:437:ARG:HB2	2.19	0.43
1:A:318:ARG:HG2	1:A:318:ARG:HH11	1.83	0.43
1:A:397:PHE:HZ	1:A:445:PHE:CE2	2.36	0.43
1:B:389:LYS:O	1:B:390:GLU:HB2	2.18	0.43
1:A:457:TYR:O	1:A:457:TYR:CG	2.72	0.43
1:A:524:LYS:NZ	3:A:1058:HOH:O	2.52	0.43
1:B:242:ASP:OD2	1:B:326:ARG:HD2	2.18	0.43
1:A:208:ASP:OD1	1:A:208:ASP:N	2.52	0.42
1:B:84:TYR:O	1:B:114:TYR:HB3	2.18	0.42
1:B:466:GLY:H	1:B:470:GLU:CD	2.22	0.42
1:B:106:VAL:O	1:B:108:THR:HG23	2.19	0.42
1:B:265:SER:C	1:B:267:TYR:H	2.21	0.42
1:B:567:GLU:OE1	1:B:571:LEU:HD21	2.20	0.42
1:B:340:GLU:O	1:B:341:PHE:C	2.56	0.42
1:B:500:TYR:HB3	1:B:529:GLU:OE2	2.19	0.42
1:A:221:ASP:O	1:A:222:LYS:C	2.58	0.42
1:B:31:LYS:HZ1	1:B:395:ARG:NH1	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:59:MET:HG2	1:B:73:ALA:HB2	2.01	0.42
1:B:563:ARG:HG2	1:B:564:PHE:N	2.35	0.42
1:A:294:GLN:CD	1:A:294:GLN:H	2.23	0.42
1:A:555:LEU:N	1:A:555:LEU:CD2	2.83	0.42
1:B:40:LEU:O	1:B:84:TYR:HA	2.20	0.42
1:B:83:ARG:NE	1:B:116:CYS:HB2	2.35	0.42
1:B:376:ASN:O	1:B:379:PHE:HB3	2.20	0.42
1:B:420:LEU:CD1	1:B:442:LEU:HB3	2.47	0.42
1:A:40:LEU:HD23	1:A:40:LEU:C	2.41	0.42
1:A:515:ASP:HB3	1:A:519:TYR:CE1	2.55	0.42
1:B:79:TYR:O	1:B:80:ARG:HB2	2.18	0.42
1:A:248:CYS:SG	1:A:271:PHE:HE1	2.43	0.42
1:A:429:LEU:HD11	1:A:436:ILE:HD13	2.02	0.42
1:B:36:ARG:NH1	1:B:89:TYR:CD1	2.88	0.42
1:B:272:HIS:HB2	1:B:287:ASP:HB2	2.02	0.42
1:A:131:TRP:CZ3	1:A:238:ARG:HG3	2.55	0.41
1:A:407:SER:HB2	1:B:9:ARG:NH2	2.34	0.41
1:B:199:PHE:CE1	1:B:316:TRP:CZ2	3.08	0.41
1:A:379:PHE:O	1:A:383:VAL:HG23	2.20	0.41
1:B:147:ASN:OD1	1:B:172:GLY:O	2.38	0.41
1:B:255:PHE:HA	1:B:271:PHE:CE2	2.54	0.41
1:A:1:MET:CE	1:A:93:GLU:HG2	2.50	0.41
1:B:156:GLY:O	1:B:157:SER:C	2.57	0.41
1:B:286:TYR:CE2	1:B:296:PRO:HB3	2.54	0.41
1:A:550:ALA:HB1	1:A:566:ALA:O	2.20	0.41
1:B:215:VAL:O	1:B:216:ASP:C	2.59	0.41
1:A:48:GLN:C	1:A:50:GLY:N	2.74	0.41
1:B:419:LEU:H	1:B:419:LEU:CD2	2.33	0.41
1:B:479:PRO:HA	1:B:482:GLN:CG	2.49	0.41
1:A:258:VAL:HG11	1:A:273:ILE:CD1	2.51	0.41
1:A:243:ALA:HB1	1:A:245:PHE:CE1	2.56	0.41
1:A:331:ASN:H	1:A:331:ASN:ND2	2.17	0.41
1:A:501:ARG:HG3	1:A:501:ARG:HH11	1.85	0.41
1:B:208:ASP:OD1	1:B:208:ASP:N	2.53	0.41
1:B:458:GLY:HA2	1:B:461:ILE:HG12	2.03	0.41
1:A:295:MET:HE1	2:C:3:GLC:O5	2.21	0.41
1:A:567:GLU:O	1:A:568:ALA:C	2.59	0.41
1:B:40:LEU:HG	1:B:54:PHE:CD2	2.56	0.41
1:B:396:GLN:O	1:B:399:ASN:HB2	2.21	0.41
1:B:419:LEU:HD23	1:B:419:LEU:O	2.19	0.41
1:B:572:CYS:O	1:B:572:CYS:SG	2.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:88:LEU:HD12	1:A:88:LEU:N	2.36	0.41
1:A:555:LEU:HD23	1:A:564:PHE:CE1	2.55	0.41
1:A:573:THR:HG22	1:A:575:LEU:HG	2.03	0.41
1:B:23:LEU:HD22	1:B:117:PHE:CD2	2.56	0.41
1:B:49:ASN:C	1:B:51:ALA:N	2.74	0.41
1:B:278:LEU:N	1:B:278:LEU:CD1	2.84	0.41
1:A:486:LEU:O	1:A:489:HIS:HB3	2.21	0.41
1:B:26:ARG:HA	1:B:71:TRP:O	2.21	0.41
1:B:179:ILE:HG12	1:B:228:LEU:HA	2.03	0.41
1:B:221:ASP:O	1:B:224:THR:N	2.54	0.41
1:A:363:MET:HB3	1:A:364:PRO:HD3	2.03	0.40
1:A:545:PRO:HA	1:A:572:CYS:HA	2.03	0.40
1:A:383:VAL:HG12	1:A:442:LEU:CD2	2.50	0.40
1:B:183:ASP:O	1:B:184:TYR:C	2.58	0.40
1:B:265:SER:C	1:B:267:TYR:N	2.75	0.40
1:B:341:PHE:CE2	1:B:354:ILE:HD13	2.56	0.40
1:B:137:TRP:CD1	1:B:452:SER:OG	2.75	0.40
1:B:241:LEU:HG	1:B:322:ILE:HG21	2.04	0.40
1:B:354:ILE:HG22	1:B:354:ILE:O	2.21	0.40
1:B:551:ARG:CA	1:B:551:ARG:NE	2.85	0.40
1:A:2:ARG:HH21	1:B:4:GLU:CG	2.35	0.40
1:A:581:VAL:HG22	1:A:582:LEU:N	2.36	0.40
1:B:170:PHE:CE1	1:B:204:ASN:HB3	2.56	0.40
1:B:258:VAL:O	1:B:262:GLY:N	2.50	0.40
1:B:308:TYR:O	1:B:311:ASP:HB2	2.21	0.40
1:B:327:LEU:HD22	1:B:338:TRP:HH2	1.84	0.40
1:B:581:VAL:HG21	1:B:583:TYR:CZ	2.55	0.40

There are no symmetry-related clashes.

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	586/588 (100%)	522 (89%)	51 (9%)	13 (2%)	6	35
1	B	586/588 (100%)	521 (89%)	56 (10%)	9 (2%)	10	44
All	All	1172/1176 (100%)	1043 (89%)	107 (9%)	22 (2%)	8	39

All (22) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	515	ASP
1	A	501	ARG
1	A	21	GLU
1	A	262	GLY
1	A	516	GLU
1	B	569	GLU
1	B	570	THR
1	A	142	PRO
1	A	160	TRP
1	A	360	HIS
1	A	537	ARG
1	A	468	ASP
1	A	568	ALA
1	B	263	GLU
1	B	468	ASP
1	B	568	ALA
1	A	118	PRO
1	B	321	ASP
1	A	44	PRO
1	B	282	PRO
1	B	329	VAL
1	A	10	PRO

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	521/521 (100%)	505 (97%)	16 (3%)	40	72

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	521/521 (100%)	501 (96%)	20 (4%)	33	67
All	All	1042/1042 (100%)	1006 (96%)	36 (4%)	36	69

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

Mol	Chain	Res	Type
1	A	20	SER
1	A	163	GLU
1	A	194	TYR
1	A	226	LYS
1	A	227	THR
1	A	231	ARG
1	A	261	ASN
1	A	268	LYS
1	A	269	ASP
1	A	331	ASN
1	A	359	TRP
1	A	378	PRO
1	A	517	MET
1	A	551	ARG
1	A	555	LEU
1	A	562	GLU
1	B	9	ARG
1	B	92	GLU
1	B	95	LEU
1	B	164	ASP
1	B	194	TYR
1	B	222	LYS
1	B	227	THR
1	B	231	ARG
1	B	260	LYS
1	B	268	LYS
1	B	278	LEU
1	B	328	ASP
1	B	331	ASN
1	B	339	ARG
1	B	359	TRP
1	B	375	MET
1	B	541	LYS
1	B	551	ARG
1	B	555	LEU
1	B	572	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	48	GLN
1	A	49	ASN
1	A	55	GLN
1	A	139	GLN
1	A	149	ASN
1	A	274	HIS
1	A	299	ASN
1	A	331	ASN
1	A	370	GLN
1	A	418	ASN
1	A	446	GLN
1	A	482	GLN
1	A	488	GLN
1	A	492	GLN
1	B	48	GLN
1	B	55	GLN
1	B	139	GLN
1	B	147	ASN
1	B	176	GLN
1	B	331	ASN
1	B	370	GLN
1	B	399	ASN
1	B	400	GLN
1	B	418	ASN
1	B	446	GLN
1	B	482	GLN
1	B	492	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 ⓘ

6 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	GLC	C	1	2	12,12,12	0.51	0	16,17,17	0.67	0
2	GLC	C	2	2	11,11,12	0.36	0	15,15,17	1.07	2 (13%)
2	GLC	C	3	2	11,11,12	0.61	0	15,15,17	0.44	0
2	GLC	D	1	2	12,12,12	0.49	0	17,17,17	0.67	0
2	GLC	D	2	2	11,11,12	0.44	0	15,15,17	0.77	1 (6%)
2	GLC	D	3	2	11,11,12	0.50	0	15,15,17	0.80	1 (6%)

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	GLC	C	2	2	-	0/2/19/22	0/1/1/1
2	GLC	C	3	2	-	0/2/19/22	0/1/1/1
2	GLC	D	1	2	-	0/2/22/22	0/1/1/1
2	GLC	D	2	2	-	0/2/19/22	0/1/1/1
2	GLC	D	3	2	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	2	GLC	C1-O5-C5	2.45	115.52	112.19
2	D	2	GLC	C1-O5-C5	2.43	115.48	112.19
2	D	3	GLC	C1-O5-C5	2.29	115.30	112.19
2	C	2	GLC	C1-C2-C3	-2.12	107.06	109.67

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	3	GLC	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
2	D	3	GLC	C4-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	3	GLC	1	0
2	D	1	GLC	2	0
2	C	2	GLC	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
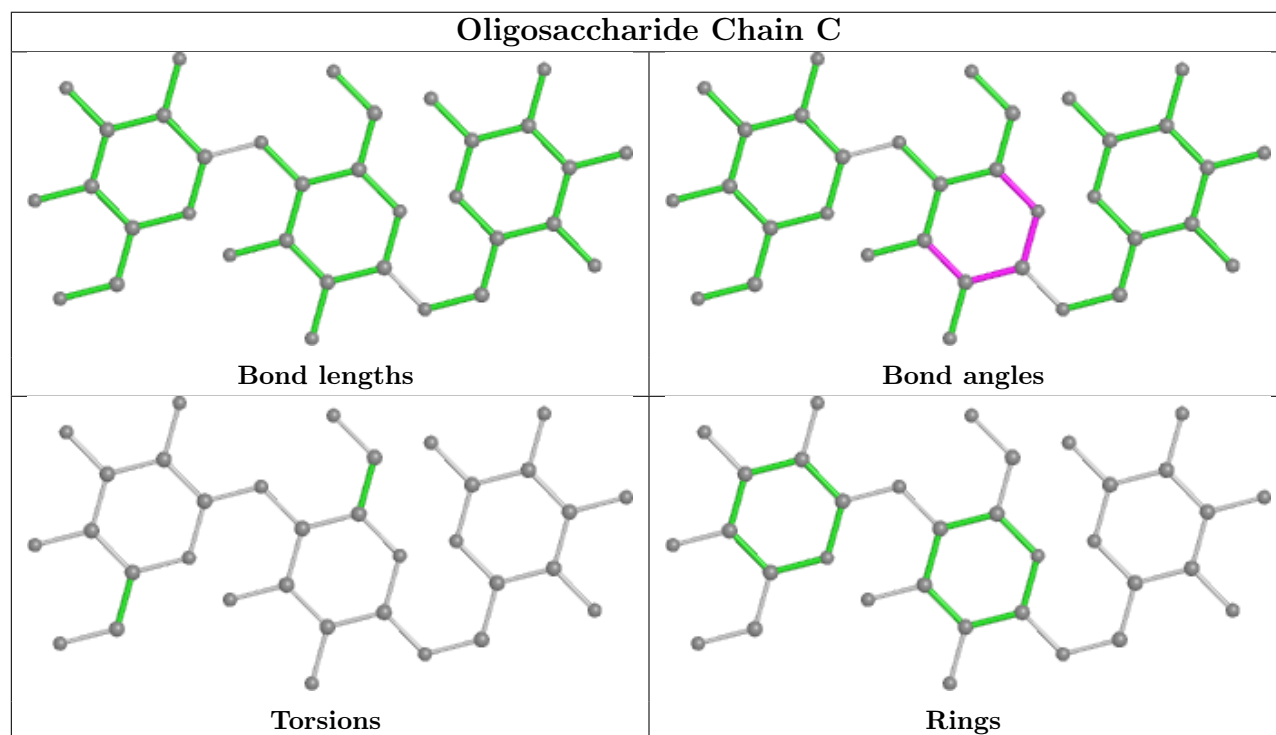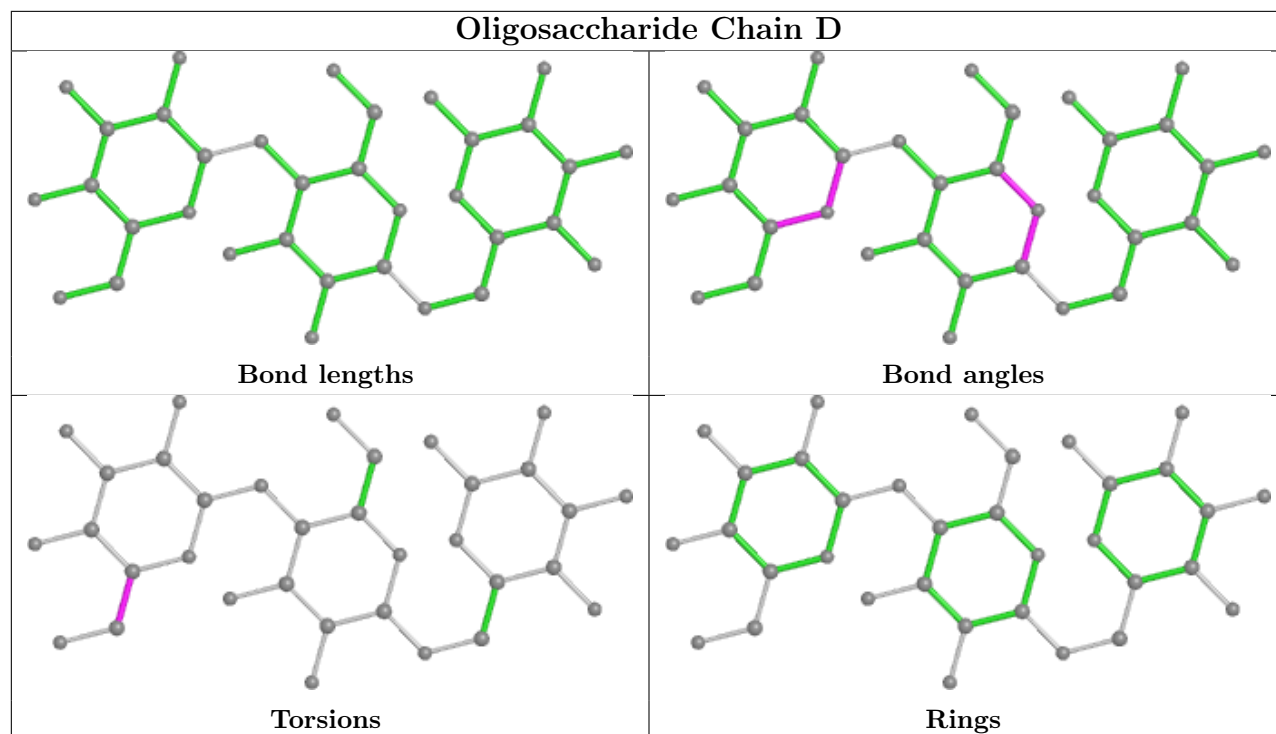
5.6 Ligand geometry (i)

There are no ligands in this entry.

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	588/588 (100%)	-0.60	7 (1%)	79	67	1, 14, 34, 73	0
1	B	588/588 (100%)	-0.61	5 (0%)	84	75	1, 14, 39, 69	0
All	All	1176/1176 (100%)	-0.60	12 (1%)	82	72	1, 14, 36, 73	0

All (12) RSRZ outliers are listed below:

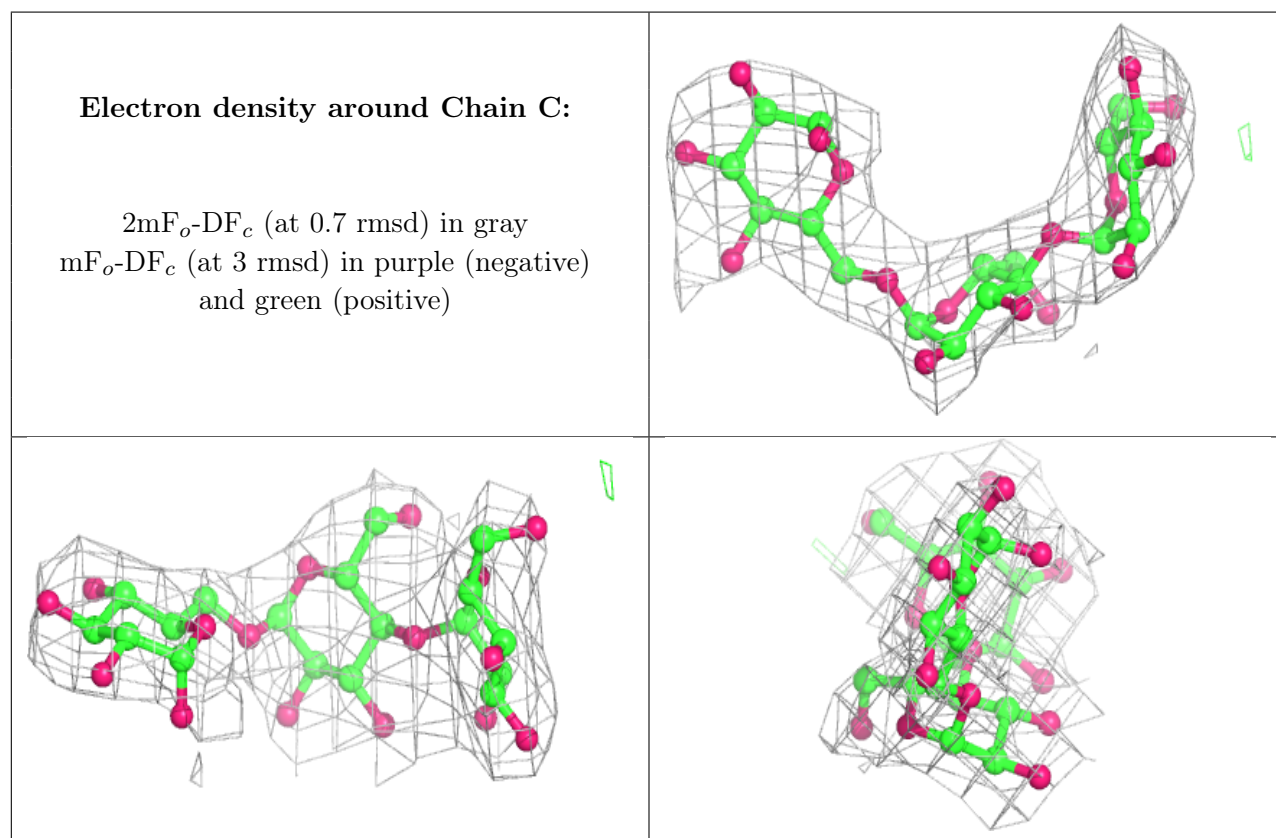| Mol	Chain	Res	Type	RSRZ
1	B	568	ALA	5.7
1	A	568	ALA	4.9
1	B	569	GLU	4.2
1	B	570	THR	3.8
1	A	569	GLU	3.6
1	A	514	ASP	3.4
1	B	567	GLU	3.2
1	B	514	ASP	3.0
1	A	49	ASN	2.7
1	A	570	THR	2.6
1	A	515	ASP	2.2
1	A	567	GLU	2.1

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

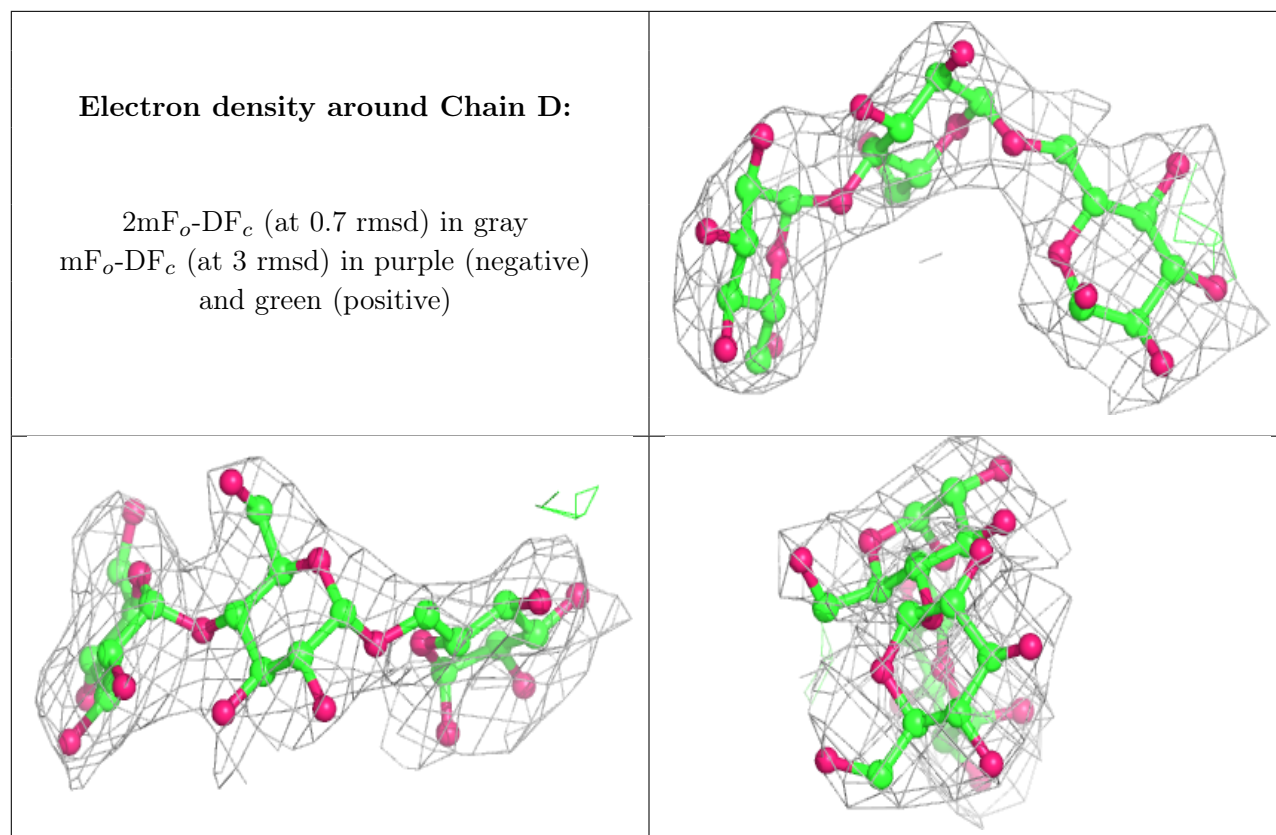There are no non-standard protein/DNA/RNA residues in this entry.

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	GLC	C	1	12/12	0.93	0.18	12,21,23,24	0
2	GLC	D	1	12/12	0.96	0.11	15,19,20,21	0
2	GLC	D	3	11/12	0.96	0.16	7,10,12,14	0
2	GLC	C	2	11/12	0.97	0.14	5,6,9,10	0
2	GLC	C	3	11/12	0.97	0.15	1,5,7,12	0
2	GLC	D	2	11/12	0.98	0.15	12,12,16,19	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 C:

$2\text{mF}_o\text{-DF}_c$ (at 0.7 rmsd) in gray
$\text{mF}_o\text{-DF}_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around Chain D:

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

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.