



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 5, 2023 – 12:56 PM JST

PDB ID : 8HQ2  
Title : Crystal structure of human ADAM22 in complex with human LGI1 mutant  
Authors : Liu, H.; Lin, Z.; Xu, F.  
Deposited on : 2022-12-13  
Resolution : 2.93 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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)  
Xtrriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

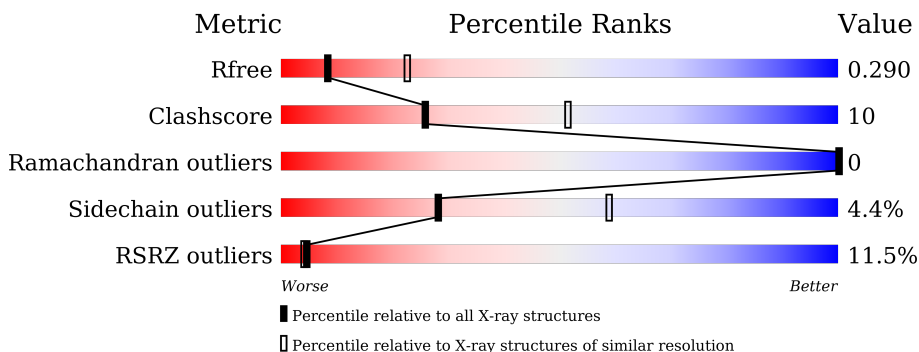
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.93 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	2969 (2.98-2.90)
Clashscore	141614	3218 (2.98-2.90)
Ramachandran outliers	138981	3122 (2.98-2.90)
Sidechain outliers	138945	3124 (2.98-2.90)
RSRZ outliers	127900	2902 (2.98-2.90)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	486	 3% 79% 20%
1	B	486	 4% 76% 22%
2	D	526	 14% 69% 28%
2	E	526	 22% 69% 28%

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

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	NAG	A	806	-	-	-	X
4	NAG	B	806	-	-	X	X
4	NAG	D	603	-	-	-	X
4	NAG	D	604	-	-	-	X
4	NAG	E	602	-	-	-	X
4	NAG	E	603	-	-	-	X
4	NAG	E	604	-	-	-	X

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 16132 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 Disintegrin and metalloproteinase domain-containing protein 22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	484	3710	2293	638	728	51	0	0	0
1	B	484	3710	2293	638	728	51	0	0	0

- Molecule 2 is a protein called Leucine-rich glioma-inactivated protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	D	516	4181	2688	696	782	15	0	0	0
2	E	516	4181	2688	696	782	15	0	0	0

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	32	HIS	-	expression tag	UNP O95970
D	33	HIS	-	expression tag	UNP O95970
D	34	HIS	-	expression tag	UNP O95970
D	35	HIS	-	expression tag	UNP O95970
D	36	HIS	-	expression tag	UNP O95970
D	37	HIS	-	expression tag	UNP O95970
D	38	HIS	-	expression tag	UNP O95970
D	88	ASN	LEU	engineered mutation	UNP O95970
D	89	ALA	PHE	engineered mutation	UNP O95970
D	474	GLN	ARG	engineered mutation	UNP O95970
E	32	HIS	-	expression tag	UNP O95970
E	33	HIS	-	expression tag	UNP O95970
E	34	HIS	-	expression tag	UNP O95970
E	35	HIS	-	expression tag	UNP O95970
E	36	HIS	-	expression tag	UNP O95970
E	37	HIS	-	expression tag	UNP O95970

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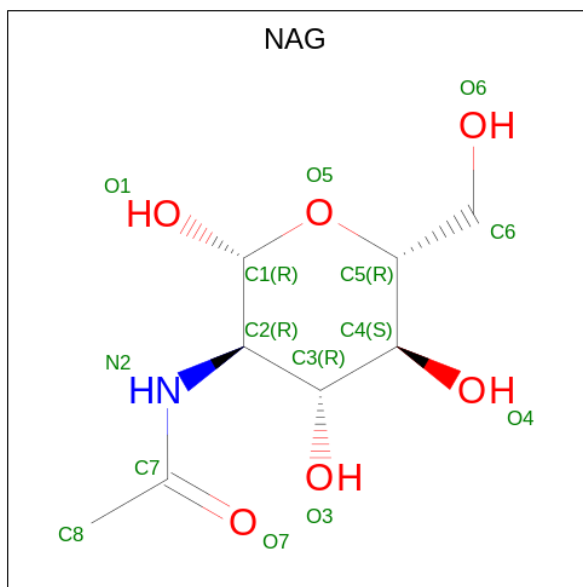
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Chain	Residue	Modelled	Actual	Comment	Reference
E	38	HIS	-	expression tag	UNP O95970
E	88	ASN	LEU	engineered mutation	UNP O95970
E	89	ALA	PHE	engineered mutation	UNP O95970
E	474	GLN	ARG	engineered mutation	UNP O95970

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	3	Total Ca 3 3	0	0
3	D	1	Total Ca 1 1	0	0
3	B	3	Total Ca 3 3	0	0
3	E	1	Total Ca 1 1	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



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

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

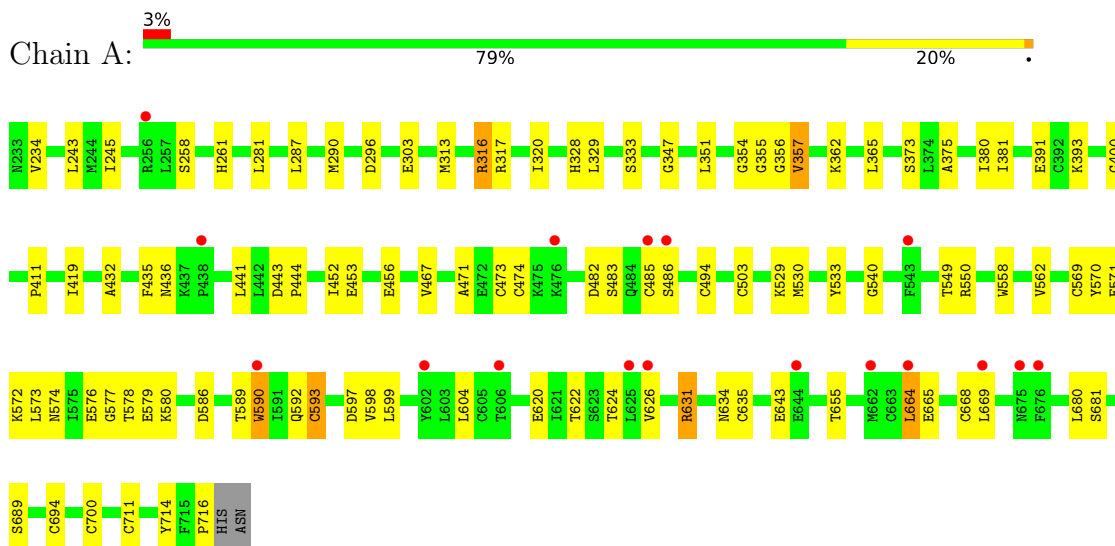
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	55	Total	O	0	0
			55	55		
5	D	46	Total	O	0	0
			46	46		
5	B	44	Total	O	0	0
			44	44		
5	E	29	Total	O	0	0
			29	29		

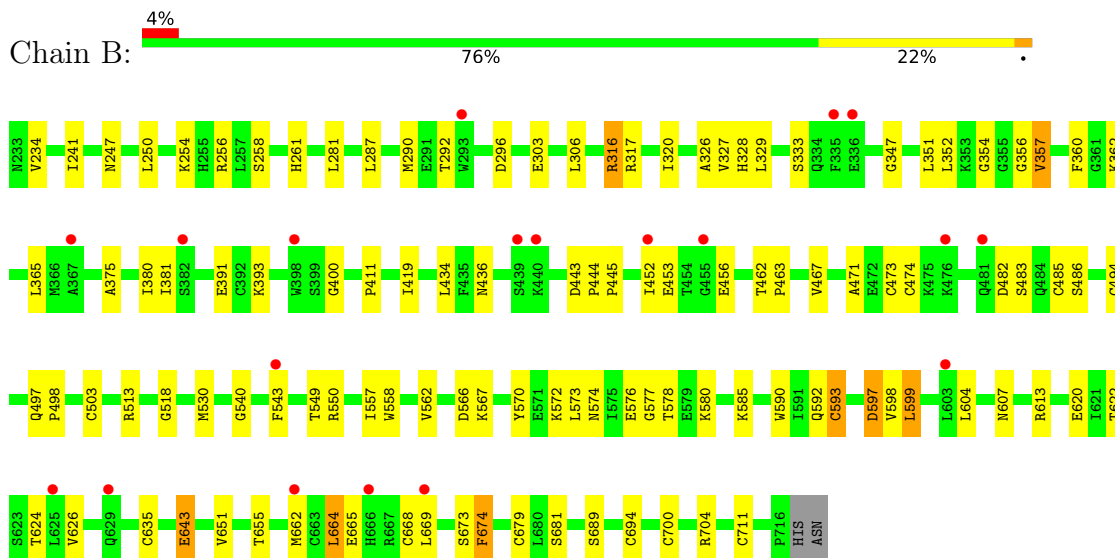
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Disintegrin and metalloproteinase domain-containing protein 22

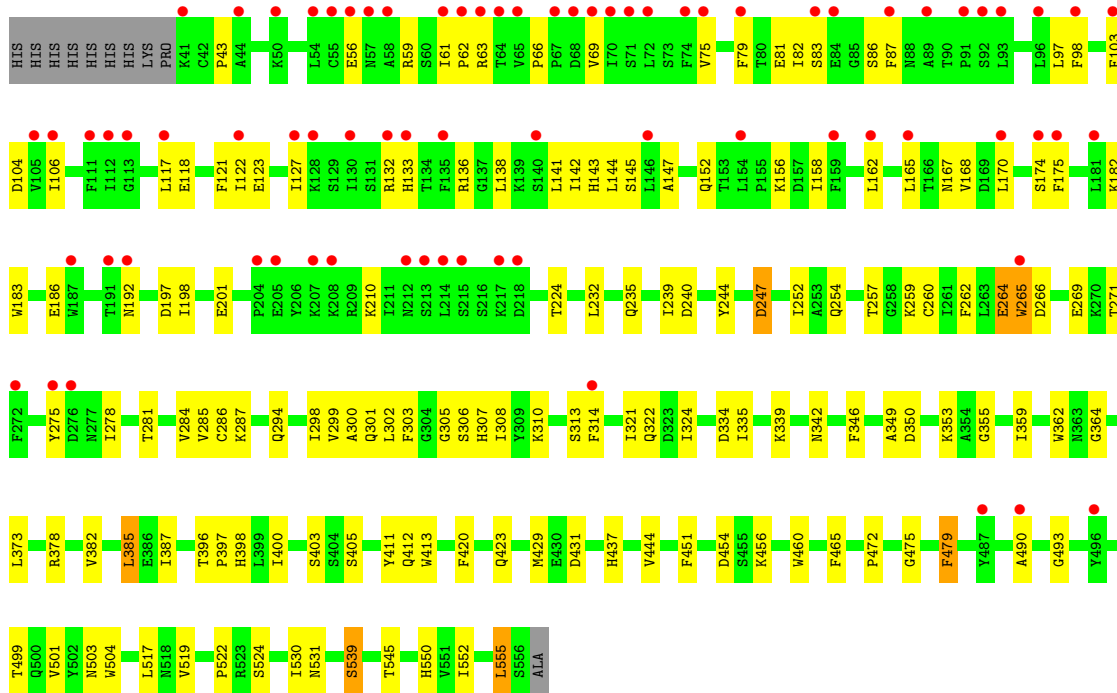


- Molecule 1: Disintegrin and metalloproteinase domain-containing protein 22

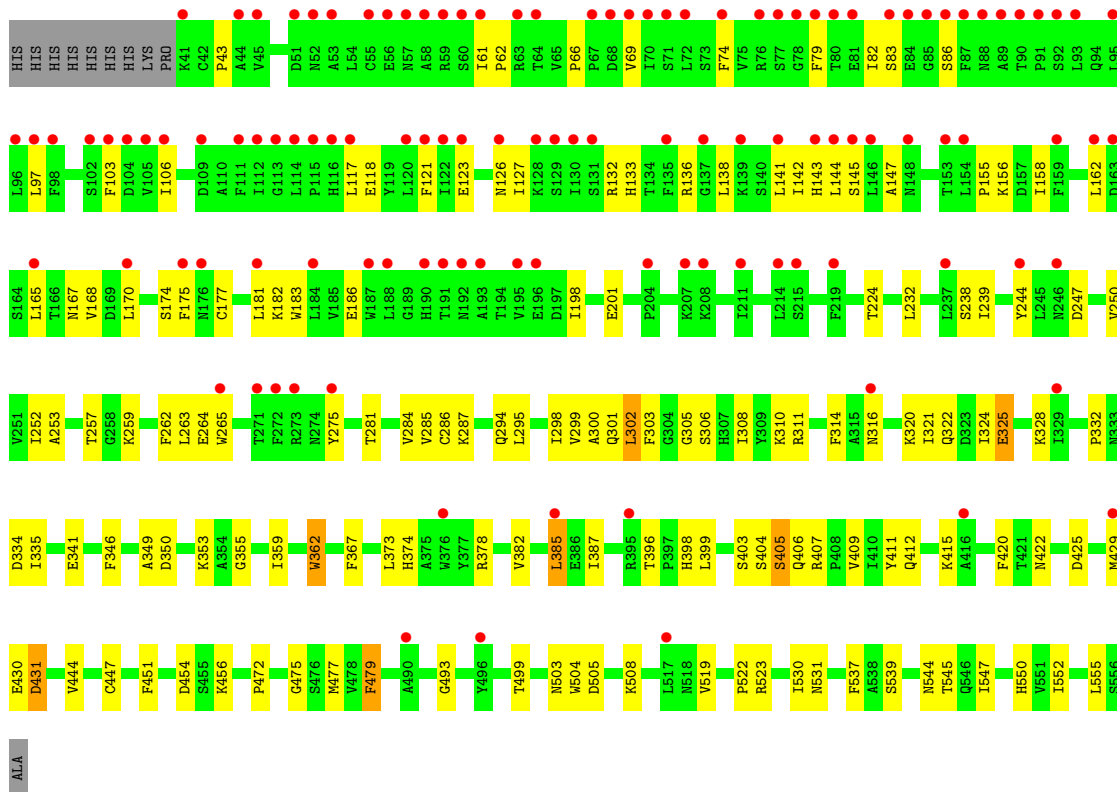


- Molecule 2: Leucine-rich glioma-inactivated protein 1





• Molecule 2: Leucine-rich glioma-inactivated protein 1





## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	53.25Å 98.85Å 131.26Å 96.21° 100.44° 91.31°	Depositor
Resolution (Å)	45.83 – 2.93 45.83 – 2.93	Depositor EDS
% Data completeness (in resolution range)	97.3 (45.83-2.93) 90.2 (45.83-2.93)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.48 (at 2.96Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155)	Depositor
R, $R_{free}$	0.245 , 0.291 0.245 , 0.290	Depositor DCC
$R_{free}$ test set	2711 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	76.1	Xtrriage
Anisotropy	0.356	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 53.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.165 for h,-k,-h-l	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	16132	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	103.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.16% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

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	0.29	0/3773	0.47	0/5079
1	B	0.30	0/3773	0.47	0/5079
2	D	0.29	0/4287	0.48	0/5818
2	E	0.28	0/4287	0.48	0/5818
All	All	0.29	0/16120	0.48	0/21794

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3710	0	3566	56	0
1	B	3710	0	3567	79	0
2	D	4181	0	4092	105	0
2	E	4181	0	4092	96	0
3	A	3	0	0	0	0
3	B	3	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
4	A	42	0	39	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	42	0	39	10	0
4	D	42	0	39	1	0
4	E	42	0	39	0	0
5	A	55	0	0	0	0
5	B	44	0	0	0	0
5	D	46	0	0	1	0
5	E	29	0	0	2	0
All	All	16132	0	15473	329	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (329) 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:B:673:SER:HA	4:B:806:NAG:H5	1.11	1.07
2:D:265:TRP:HA	2:D:271:THR:HG22	1.43	1.00
1:B:483:SER:HB3	1:B:494:CYS:HB3	1.51	0.92
1:B:664:LEU:HD12	1:B:665:GLU:N	1.87	0.89
2:D:265:TRP:CB	2:D:271:THR:CG2	2.51	0.88
1:A:586:ASP:HB3	1:A:589:THR:OG1	1.72	0.87
2:D:240:ASP:OD2	2:D:287:LYS:HD2	1.74	0.87
1:B:673:SER:O	4:B:806:NAG:H3	1.73	0.86
2:D:264:GLU:HB3	2:D:275:TYR:CD1	2.12	0.85
1:A:483:SER:HB3	1:A:494:CYS:HB3	1.60	0.83
1:B:673:SER:HA	4:B:806:NAG:C5	2.05	0.82
2:D:284:VAL:HG12	2:D:285:VAL:HG23	1.64	0.80
2:D:247:ASP:OD2	2:D:265:TRP:HZ2	1.64	0.79
2:E:284:VAL:HG12	2:E:285:VAL:HG23	1.66	0.78
2:D:265:TRP:CA	2:D:271:THR:HG22	2.13	0.78
2:D:265:TRP:HB2	2:D:271:THR:HG23	1.69	0.75
2:D:411:TYR:HB3	2:D:420:PHE:HB3	1.70	0.74
1:B:597:ASP:HB3	1:B:668:CYS:H	1.53	0.72
2:D:257:THR:HG23	2:D:259:LYS:H	1.55	0.72
2:D:265:TRP:HA	2:D:271:THR:CG2	2.17	0.72
2:D:306:SER:HB3	2:D:324:ILE:HB	1.72	0.72
1:B:580:LYS:HA	1:B:622:THR:HG21	1.69	0.72
1:B:673:SER:CA	4:B:806:NAG:H5	2.06	0.72
2:E:306:SER:HB3	2:E:324:ILE:HB	1.72	0.71
2:D:265:TRP:CA	2:D:271:THR:CG2	2.69	0.71
2:D:349:ALA:HB2	2:D:382:VAL:HG23	1.73	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:580:LYS:HA	1:A:622:THR:HG21	1.72	0.70
2:D:265:TRP:HB2	2:D:271:THR:CG2	2.20	0.70
2:E:349:ALA:HB2	2:E:382:VAL:HG23	1.74	0.68
2:E:132:ARG:HG2	2:E:155:PRO:HB2	1.74	0.68
1:A:573:LEU:HD21	1:A:624:THR:HB	1.77	0.66
1:B:664:LEU:HD12	1:B:664:LEU:C	2.14	0.66
1:A:597:ASP:HB3	1:A:668:CYS:H	1.59	0.66
2:E:257:THR:HG23	2:E:259:LYS:H	1.59	0.66
2:E:411:TYR:HB3	2:E:420:PHE:HB3	1.76	0.66
1:B:573:LEU:HD21	1:B:624:THR:HB	1.76	0.66
1:B:473:CYS:CB	1:B:486:SER:HA	2.26	0.66
1:B:362:LYS:HE2	2:E:431:ASP:OD1	1.97	0.65
1:A:664:LEU:HB3	1:A:669:LEU:HD13	1.79	0.65
1:A:664:LEU:HD22	1:A:665:GLU:N	2.13	0.64
2:D:387:ILE:HG22	2:D:444:VAL:HG21	1.79	0.63
1:B:673:SER:HB3	4:B:806:NAG:O4	2.00	0.62
1:B:577:GLY:HA3	1:B:592:GLN:HG2	1.81	0.61
1:A:573:LEU:HD22	1:A:604:LEU:HD21	1.82	0.61
1:A:473:CYS:CB	1:A:486:SER:HA	2.30	0.61
1:B:473:CYS:HB2	1:B:486:SER:HA	1.80	0.61
2:D:265:TRP:CB	2:D:271:THR:HG23	2.26	0.61
2:E:454:ASP:HA	2:E:472:PRO:HA	1.83	0.60
2:E:239:ILE:HD13	2:E:537:PHE:HB3	1.84	0.60
2:E:239:ILE:HG12	2:E:252:ILE:HG12	1.82	0.60
1:A:577:GLY:HA3	1:A:592:GLN:HG2	1.84	0.59
1:B:306:LEU:HD13	1:B:643:GLU:HG3	1.84	0.59
1:A:474:CYS:HB2	1:A:486:SER:OG	2.02	0.59
1:A:473:CYS:HB2	1:A:486:SER:HA	1.84	0.59
2:D:260:CYS:HB3	2:D:278:ILE:HB	1.85	0.58
2:E:387:ILE:HG22	2:E:444:VAL:HG21	1.85	0.58
2:E:409:VAL:HG12	2:E:425:ASP:HB3	1.84	0.58
2:D:310:LYS:HB3	2:D:321:ILE:HG13	1.84	0.57
1:B:550:ARG:HG3	1:B:655:THR:HG21	1.85	0.57
1:A:443:ASP:OD1	1:A:444:PRO:HD2	2.04	0.57
1:A:281:LEU:HD23	1:A:419:ILE:HD13	1.86	0.57
2:D:123:GLU:HB2	2:D:147:ALA:O	2.03	0.57
1:A:365:LEU:HD21	2:D:378:ARG:NH1	2.18	0.57
1:B:281:LEU:HD23	1:B:419:ILE:HD13	1.85	0.57
1:A:604:LEU:HD23	1:A:635:CYS:HB2	1.87	0.57
2:D:454:ASP:HA	2:D:472:PRO:HA	1.86	0.57
1:B:443:ASP:OD1	1:B:444:PRO:HD2	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:239:ILE:HG12	2:D:252:ILE:HG12	1.87	0.57
1:B:365:LEU:HD21	2:E:378:ARG:NH1	2.20	0.57
2:E:43:PRO:HG3	2:E:62:PRO:HB3	1.86	0.57
2:D:247:ASP:CG	2:D:265:TRP:HZ2	2.07	0.57
2:E:403:SER:HB2	2:E:406:GLN:HB3	1.86	0.56
1:B:445:PRO:HA	1:B:453:GLU:OE2	2.05	0.56
2:E:253:ALA:HB2	2:E:286:CYS:SG	2.45	0.56
2:D:83:SER:HB3	2:D:86:SER:HB2	1.87	0.56
1:B:673:SER:O	4:B:806:NAG:C3	2.50	0.56
2:E:522:PRO:HA	2:E:539:SER:O	2.05	0.56
2:E:97:LEU:HA	2:E:121:PHE:O	2.06	0.56
2:D:265:TRP:HB3	2:D:271:THR:CG2	2.36	0.56
2:D:359:ILE:HD11	2:D:373:LEU:HD11	1.88	0.56
2:D:265:TRP:CB	2:D:271:THR:HG22	2.34	0.56
2:D:301:GLN:HB2	2:D:305:GLY:HA3	1.87	0.55
1:B:485:CYS:O	1:B:494:CYS:HA	2.05	0.55
2:E:141:LEU:HD21	2:E:144:LEU:HB2	1.88	0.55
1:B:570:TYR:HB3	1:B:598:VAL:HG12	1.89	0.55
2:E:310:LYS:HB3	2:E:321:ILE:HG13	1.89	0.55
2:E:325:GLU:OE2	2:E:328:LYS:HG3	2.05	0.55
2:E:295:LEU:HD23	2:E:311:ARG:HD2	1.88	0.55
2:D:43:PRO:HG3	2:D:62:PRO:HB3	1.89	0.54
1:B:258:SER:HB3	1:B:261:HIS:HB2	1.90	0.54
2:D:97:LEU:HA	2:D:121:PHE:O	2.07	0.54
1:B:558:TRP:HB2	1:B:562:VAL:HG21	1.89	0.54
1:B:664:LEU:CD1	1:B:665:GLU:N	2.67	0.54
1:A:328:HIS:CE1	1:A:356:GLY:HA3	2.42	0.54
1:B:328:HIS:CE1	1:B:356:GLY:HA3	2.43	0.54
1:B:393:LYS:HE3	2:E:303:PHE:HZ	1.71	0.54
1:A:530:MET:HG2	1:A:694:CYS:HB3	1.89	0.54
1:B:287:LEU:HD21	1:B:290:MET:HE2	1.89	0.53
2:E:123:GLU:HB2	2:E:147:ALA:O	2.08	0.53
1:B:573:LEU:HD22	1:B:604:LEU:HD21	1.91	0.53
2:E:321:ILE:HG22	2:E:322:GLN:HG3	1.89	0.53
2:E:398:HIS:NE2	2:E:412:GLN:HG3	2.24	0.53
1:A:287:LEU:HD21	1:A:290:MET:HE2	1.90	0.53
2:D:350:ASP:OD2	2:D:355:GLY:HA3	2.09	0.53
1:A:681:SER:HB2	1:A:689:SER:H	1.74	0.53
1:A:558:TRP:HB2	1:A:562:VAL:HG21	1.91	0.52
2:D:165:LEU:HD21	2:D:168:VAL:HG23	1.90	0.52
1:B:250:LEU:HD22	1:B:333:SER:HB3	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:673:SER:CB	4:B:806:NAG:O4	2.58	0.52
1:A:329:LEU:HD23	1:A:357:VAL:HG22	1.92	0.52
2:D:493:GLY:HA2	2:D:499:THR:HG23	1.92	0.52
1:B:513:ARG:HH22	1:B:704:ARG:HH21	1.57	0.52
1:A:574:ASN:O	1:A:593:CYS:HB2	2.10	0.52
1:B:576:GLU:HB3	1:B:578:THR:HG23	1.92	0.52
2:E:83:SER:HB3	2:E:86:SER:HB2	1.92	0.52
2:E:298:ILE:HG22	2:E:335:ILE:HD13	1.92	0.52
2:D:265:TRP:CD1	2:D:265:TRP:N	2.73	0.51
2:D:451:PHE:CE1	2:D:475:GLY:HA2	2.45	0.51
2:E:311:ARG:HH21	2:E:316:ASN:HB3	1.75	0.51
1:A:483:SER:CB	1:A:494:CYS:HB3	2.37	0.51
2:D:174:SER:HA	2:D:201:GLU:HG3	1.93	0.51
2:E:103:PHE:HB2	2:E:127:ILE:HG12	1.92	0.51
2:E:117:LEU:HD23	2:E:138:LEU:HD13	1.93	0.51
2:E:301:GLN:HB2	2:E:305:GLY:HA3	1.91	0.51
2:D:522:PRO:HA	2:D:539:SER:O	2.11	0.51
2:D:262:PHE:HB3	2:D:275:TYR:CE1	2.45	0.51
2:E:165:LEU:HD21	2:E:168:VAL:HG23	1.93	0.51
2:D:247:ASP:OD2	2:D:265:TRP:CZ2	2.54	0.50
2:D:550:HIS:NE2	2:D:552:ILE:HD11	2.26	0.50
2:E:141:LEU:HD22	2:E:162:LEU:HD23	1.94	0.50
2:E:262:PHE:HB3	2:E:275:TYR:CE1	2.46	0.50
2:E:143:HIS:CD2	2:E:167:ASN:HB2	2.46	0.50
2:E:550:HIS:NE2	2:E:552:ILE:HD11	2.27	0.50
1:B:673:SER:HB3	4:B:806:NAG:H3	1.94	0.50
2:E:247:ASP:HB3	2:E:265:TRP:HH2	1.77	0.50
2:E:493:GLY:HA2	2:E:499:THR:HG23	1.93	0.50
2:D:82:ILE:HG21	2:D:106:ILE:HG23	1.94	0.50
1:B:329:LEU:HD23	1:B:357:VAL:HG22	1.94	0.50
2:E:396:THR:HB	2:E:398:HIS:HE1	1.76	0.50
2:D:244:TYR:O	2:D:247:ASP:HB2	2.12	0.50
2:D:339:LYS:NZ	2:D:342:ASN:HA	2.25	0.50
1:A:714:TYR:CZ	1:A:716:PRO:HG3	2.46	0.50
2:E:298:ILE:HG13	2:E:308:ILE:HG12	1.93	0.50
2:E:82:ILE:HG21	2:E:106:ILE:HG23	1.93	0.49
1:A:441:LEU:HD13	1:A:453:GLU:OE1	2.12	0.49
1:B:585:LYS:HB2	1:B:590:TRP:CZ3	2.47	0.49
2:D:385:LEU:HD12	2:D:398:HIS:HB2	1.94	0.49
2:D:141:LEU:HD21	2:D:144:LEU:HB2	1.93	0.49
2:D:396:THR:HB	2:D:398:HIS:HE1	1.78	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:247:ASP:HB3	2:E:265:TRP:CH2	2.48	0.49
1:B:483:SER:CB	1:B:494:CYS:HB3	2.33	0.49
1:B:326:ALA:HA	1:B:354:GLY:O	2.13	0.48
2:E:262:PHE:HB3	2:E:275:TYR:CZ	2.48	0.48
2:D:141:LEU:HD22	2:D:162:LEU:HD23	1.95	0.48
2:D:156:LYS:HA	2:D:183:TRP:CD2	2.48	0.48
2:E:144:LEU:O	2:E:168:VAL:HA	2.13	0.48
1:A:485:CYS:O	1:A:494:CYS:HA	2.13	0.48
2:D:298:ILE:HG22	2:D:335:ILE:HD13	1.96	0.48
2:E:385:LEU:HD12	2:E:398:HIS:HB2	1.96	0.48
1:A:680:LEU:HD12	1:A:680:LEU:H	1.78	0.48
2:D:142:ILE:HG23	2:D:143:HIS:H	1.79	0.48
2:D:143:HIS:CD2	2:D:167:ASN:HB2	2.48	0.48
2:E:156:LYS:HA	2:E:183:TRP:CD2	2.49	0.48
2:E:244:TYR:HE2	2:E:311:ARG:HD3	1.79	0.48
2:D:387:ILE:HD12	2:D:460:TRP:CE2	2.49	0.48
2:E:244:TYR:CE2	2:E:311:ARG:HD3	2.49	0.48
2:D:298:ILE:HG13	2:D:308:ILE:HG12	1.96	0.48
2:E:232:LEU:HB2	2:E:545:THR:HB	1.95	0.48
2:E:142:ILE:HG23	2:E:143:HIS:H	1.79	0.48
2:D:530:ILE:HG22	2:D:531:ASN:H	1.78	0.47
1:B:664:LEU:HB3	1:B:669:LEU:HD22	1.96	0.47
2:E:224:THR:HG22	2:E:552:ILE:HD12	1.96	0.47
2:D:460:TRP:HE3	2:D:465:PHE:CE1	2.32	0.47
1:B:540:GLY:HA3	1:B:549:THR:HG22	1.95	0.47
1:A:571:GLU:HA	1:A:598:VAL:HG11	1.95	0.47
1:A:576:GLU:HB3	1:A:578:THR:HG23	1.97	0.47
2:D:362:TRP:CH2	2:D:364:GLY:HA2	2.49	0.47
1:B:558:TRP:CB	1:B:562:VAL:HG21	2.45	0.47
2:E:429:MET:SD	2:E:456:LYS:HE3	2.54	0.47
2:D:232:LEU:HB2	2:D:545:THR:HB	1.95	0.47
2:D:429:MET:SD	2:D:456:LYS:HE3	2.55	0.47
2:E:324:ILE:HD11	2:E:346:PHE:HZ	1.80	0.47
1:B:453:GLU:O	1:B:456:GLU:HB2	2.15	0.47
1:B:664:LEU:C	1:B:664:LEU:CD1	2.83	0.47
2:E:285:VAL:HG12	2:E:287:LYS:HG2	1.97	0.46
2:E:407:ARG:HG3	2:E:430:GLU:HG3	1.97	0.46
1:A:258:SER:HB3	1:A:261:HIS:HB2	1.98	0.46
2:D:265:TRP:CA	2:D:271:THR:HG23	2.45	0.46
2:D:321:ILE:HG22	2:D:322:GLN:HG3	1.96	0.46
2:D:362:TRP:CZ3	2:D:364:GLY:HA2	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:673:SER:O	4:B:806:NAG:C1	2.64	0.46
2:D:132:ARG:O	2:D:158:ILE:HD12	2.15	0.46
1:A:570:TYR:HB3	1:A:598:VAL:HG12	1.96	0.46
2:D:423:GLN:HG3	2:D:423:GLN:O	2.14	0.46
1:A:316:ARG:HB2	1:A:320:ILE:HD12	1.96	0.46
2:E:121:PHE:HD1	2:E:145:SER:HB3	1.81	0.46
2:D:170:LEU:HB2	2:D:198:ILE:HG21	1.98	0.46
2:D:117:LEU:HD23	2:D:138:LEU:HD13	1.98	0.46
1:B:317:ARG:HG3	1:B:351:LEU:HD21	1.98	0.46
1:B:375:ALA:HB1	1:B:380:ILE:HB	1.98	0.46
1:B:574:ASN:O	1:B:593:CYS:HB2	2.16	0.46
1:B:604:LEU:HD23	1:B:635:CYS:HB3	1.98	0.46
2:D:98:PHE:HD1	2:D:122:ILE:HG12	1.81	0.45
1:A:540:GLY:HA3	1:A:549:THR:HG22	1.98	0.45
1:B:497:GLN:O	1:B:518:GLY:HA2	2.16	0.45
2:E:177:CYS:HA	2:E:181:LEU:HD12	1.97	0.45
1:A:631:ARG:HD2	1:A:631:ARG:HA	1.64	0.45
2:D:144:LEU:O	2:D:168:VAL:HA	2.16	0.45
2:D:235:GLN:O	2:D:254:GLN:HG3	2.16	0.45
2:E:350:ASP:OD2	2:E:355:GLY:HA3	2.17	0.45
1:A:579:GLU:HG2	1:A:590:TRP:CZ2	2.51	0.45
1:B:530:MET:HG2	1:B:694:CYS:HB3	1.97	0.45
2:E:287:LYS:HG3	2:E:335:ILE:HB	1.99	0.45
2:E:396:THR:HB	2:E:398:HIS:CE1	2.51	0.45
2:D:81:GLU:OE1	2:D:104:ASP:HB2	2.17	0.45
1:B:393:LYS:HE3	2:E:303:PHE:CZ	2.49	0.45
2:E:530:ILE:HG22	2:E:531:ASN:H	1.82	0.45
1:A:328:HIS:HE1	1:A:373:SER:HB3	1.81	0.45
2:D:79:PHE:HB2	2:D:103:PHE:HE1	1.82	0.45
2:D:285:VAL:HG21	2:D:334:ASP:HA	1.98	0.45
1:B:316:ARG:HG3	1:B:317:ARG:N	2.31	0.45
2:D:103:PHE:HB2	2:D:127:ILE:HG12	1.99	0.45
2:D:412:GLN:NE2	5:D:703:HOH:O	2.50	0.45
2:E:451:PHE:CE1	2:E:475:GLY:HA2	2.52	0.45
1:A:558:TRP:CB	1:A:562:VAL:HG21	2.47	0.44
2:D:224:THR:HG22	2:D:552:ILE:HD12	2.00	0.44
2:E:79:PHE:HB2	2:E:103:PHE:HE1	1.83	0.44
1:A:572:LYS:HD3	1:A:626:VAL:HG11	1.98	0.44
2:D:133:HIS:HB3	2:D:136:ARG:HE	1.83	0.44
1:B:400:GLY:O	1:B:411:PRO:HB3	2.18	0.44
2:E:359:ILE:HD11	2:E:373:LEU:HD11	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:ALA:HB1	1:A:380:ILE:HB	2.00	0.44
1:A:700:CYS:HB3	1:A:711:CYS:SG	2.57	0.44
2:E:61:ILE:HG23	2:E:74:PHE:HZ	1.81	0.44
2:E:281:THR:O	2:E:301:GLN:HB3	2.17	0.44
2:E:170:LEU:HB2	2:E:198:ILE:HG21	2.00	0.44
1:A:400:GLY:O	1:A:411:PRO:HB3	2.18	0.44
1:B:597:ASP:CB	1:B:668:CYS:H	2.28	0.44
1:B:700:CYS:HB3	1:B:711:CYS:SG	2.58	0.44
2:E:285:VAL:HG21	2:E:334:ASP:HA	1.99	0.44
2:D:182:LYS:O	2:D:186:GLU:HG2	2.18	0.44
2:E:265:TRP:H	2:E:265:TRP:HE3	1.63	0.44
1:A:453:GLU:O	1:A:456:GLU:HB2	2.18	0.43
2:D:265:TRP:CD1	2:D:265:TRP:O	2.71	0.43
1:A:243:LEU:HD21	1:A:245:ILE:HD11	2.00	0.43
1:A:362:LYS:HG3	2:D:405:SER:OG	2.18	0.43
1:B:347:GLY:O	1:B:354:GLY:HA2	2.18	0.43
1:B:673:SER:O	4:B:806:NAG:C2	2.67	0.43
2:E:133:HIS:HB3	2:E:136:ARG:HE	1.82	0.43
2:D:281:THR:O	2:D:301:GLN:HB3	2.18	0.43
2:D:396:THR:HB	2:D:398:HIS:CE1	2.53	0.43
1:B:241:ILE:HG12	1:B:434:LEU:HD22	1.99	0.43
1:B:467:VAL:HA	1:B:471:ALA:HB2	2.00	0.43
2:E:232:LEU:HD11	2:E:547:ILE:HD11	2.00	0.43
2:E:132:ARG:O	2:E:158:ILE:HD12	2.18	0.43
2:E:405:SER:HB2	5:E:701:HOH:O	2.17	0.43
2:E:523:ARG:HA	2:E:523:ARG:HD3	1.85	0.43
2:D:300:ALA:HB2	2:D:335:ILE:HD11	2.01	0.43
1:B:247:ASN:HB2	1:B:292:THR:HG23	1.99	0.43
2:D:397:PRO:HG2	2:D:413:TRP:HB3	1.99	0.43
2:E:302:LEU:HD12	2:E:332:PRO:HD2	2.00	0.43
1:A:586:ASP:HB3	1:A:589:THR:HG1	1.79	0.43
1:B:462:THR:HG22	1:B:463:PRO:HD2	2.01	0.43
1:B:679:CYS:HB3	1:B:700:CYS:SG	2.58	0.43
2:E:264:GLU:HB3	2:E:275:TYR:CD1	2.54	0.43
1:A:313:MET:SD	1:A:355:GLY:HA3	2.58	0.43
1:B:352:LEU:HD12	1:B:352:LEU:H	1.84	0.43
1:B:254:LYS:HE2	1:B:360:PHE:CE2	2.54	0.42
2:E:250:VAL:HB	2:E:263:LEU:HB2	2.01	0.42
2:E:503:ASN:OD1	2:E:504:TRP:N	2.52	0.42
1:B:566:ASP:OD1	1:B:567:LYS:N	2.52	0.42
2:E:409:VAL:HA	2:E:425:ASP:HA	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:192:ASN:HD22	4:D:604:NAG:C7	2.31	0.42
1:B:543:PHE:HZ	1:B:662:MET:SD	2.42	0.42
1:B:572:LYS:HD3	1:B:626:VAL:HG11	2.02	0.42
2:D:262:PHE:HB3	2:D:275:TYR:CZ	2.54	0.42
2:D:339:LYS:HZ2	2:D:342:ASN:HA	1.85	0.42
1:B:681:SER:HB2	1:B:689:SER:H	1.85	0.42
1:A:634:ASN:HD22	4:A:804:NAG:H83	1.84	0.42
1:B:473:CYS:SG	1:B:486:SER:HA	2.60	0.42
2:E:174:SER:HA	2:E:201:GLU:HG3	2.02	0.42
1:A:681:SER:CB	1:A:689:SER:H	2.32	0.42
2:D:555:LEU:HD22	2:D:555:LEU:HA	1.95	0.42
1:B:557:ILE:O	1:B:613:ARG:HB2	2.19	0.42
2:E:156:LYS:HA	2:E:183:TRP:CE2	2.55	0.42
2:D:503:ASN:OD1	2:D:504:TRP:N	2.53	0.42
1:B:562:VAL:HG22	1:B:607:ASN:O	2.19	0.42
2:D:324:ILE:HD11	2:D:346:PHE:HZ	1.85	0.42
2:E:182:LYS:O	2:E:186:GLU:HG2	2.20	0.42
2:D:61:ILE:HD13	2:D:87:PHE:CE1	2.55	0.42
2:D:66:PRO:HB2	2:D:69:VAL:HG23	2.02	0.42
2:D:385:LEU:HB3	2:D:437:HIS:CD2	2.55	0.42
2:D:501:VAL:HG21	2:D:517:LEU:HD13	2.00	0.42
2:E:399:LEU:HB2	2:E:411:TYR:HB2	2.02	0.42
2:D:479:PHE:CE1	2:D:490:ALA:HB1	2.54	0.41
1:B:316:ARG:HB2	1:B:320:ILE:HD12	2.01	0.41
1:A:393:LYS:HE3	2:D:303:PHE:HZ	1.85	0.41
1:A:550:ARG:HG3	1:A:655:THR:HG21	2.02	0.41
2:D:121:PHE:HD1	2:D:145:SER:HB3	1.85	0.41
2:D:301:GLN:HE21	2:D:307:HIS:HD2	1.68	0.41
2:E:362:TRP:HB2	2:E:367:PHE:CE1	2.55	0.41
2:E:505:ASP:HB3	2:E:508:LYS:HB2	2.01	0.41
2:D:56:GLU:HG3	2:D:75:VAL:O	2.20	0.41
1:B:664:LEU:HD22	1:B:674:PHE:CZ	2.55	0.41
2:D:152:GLN:HA	2:D:174:SER:O	2.21	0.41
1:B:474:CYS:HB2	1:B:486:SER:HB2	2.01	0.41
2:E:118:GLU:HB3	2:E:142:ILE:HG22	2.02	0.41
1:A:317:ARG:HG3	1:A:351:LEU:HD21	2.02	0.41
2:D:519:VAL:HG13	2:D:522:PRO:HD3	2.03	0.41
1:A:347:GLY:O	1:A:354:GLY:HA2	2.21	0.41
2:E:66:PRO:HB2	2:E:69:VAL:HG23	2.02	0.41
2:E:300:ALA:HB2	2:E:335:ILE:HD11	2.02	0.41
2:E:519:VAL:HG13	2:E:522:PRO:HD3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:316:ARG:HD2	1:B:327:VAL:HB	2.03	0.41
2:E:477:MET:HG3	2:E:523:ARG:CZ	2.51	0.41
2:D:142:ILE:HG23	2:D:143:HIS:N	2.36	0.41
2:E:422:ASN:HD22	2:E:422:ASN:HA	1.74	0.41
2:E:447:CYS:HB3	2:E:479:PHE:CD2	2.56	0.41
1:A:432:ALA:O	1:A:435:PHE:HD2	2.04	0.40
2:D:118:GLU:HB3	2:D:142:ILE:HG22	2.01	0.40
2:E:374:HIS:HE1	5:E:721:HOH:O	2.03	0.40
1:A:467:VAL:HA	1:A:471:ALA:HB2	2.03	0.40
1:A:529:LYS:HB3	1:A:533:TYR:CD2	2.56	0.40
2:D:197:ASP:HB3	2:D:210:LYS:HZ2	1.87	0.40
2:D:385:LEU:HD21	2:D:400:ILE:HD12	2.03	0.40
1:B:599:LEU:O	1:B:651:VAL:HG21	2.22	0.40
1:B:497:GLN:HG3	1:B:498:PRO:HD2	2.04	0.40
2:E:341:GLU:OE2	2:E:415:LYS:HD3	2.21	0.40
2:D:266:ASP:H	2:D:271:THR:HA	1.86	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	482/486 (99%)	474 (98%)	8 (2%)	0	100	100
1	B	482/486 (99%)	472 (98%)	10 (2%)	0	100	100
2	D	514/526 (98%)	496 (96%)	18 (4%)	0	100	100
2	E	514/526 (98%)	497 (97%)	17 (3%)	0	100	100
All	All	1992/2024 (98%)	1939 (97%)	53 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	418/420 (100%)	398 (95%)	20 (5%)	25	56
1	B	418/420 (100%)	399 (96%)	19 (4%)	27	58
2	D	473/482 (98%)	452 (96%)	21 (4%)	28	59
2	E	473/482 (98%)	455 (96%)	18 (4%)	33	64
All	All	1782/1804 (99%)	1704 (96%)	78 (4%)	28	59

All (78) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	234	VAL
1	A	296	ASP
1	A	303	GLU
1	A	316	ARG
1	A	333	SER
1	A	357	VAL
1	A	381	ILE
1	A	391	GLU
1	A	436	ASN
1	A	452	ILE
1	A	482	ASP
1	A	503	CYS
1	A	569	CYS
1	A	590	TRP
1	A	593	CYS
1	A	599	LEU
1	A	620	GLU
1	A	631	ARG
1	A	643	GLU
1	A	664	LEU
2	D	59	ARG
2	D	63	ARG
2	D	175	PHE
2	D	247	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	D	264	GLU
2	D	265	TRP
2	D	269	GLU
2	D	286	CYS
2	D	294	GLN
2	D	299	VAL
2	D	302	LEU
2	D	313	SER
2	D	314	PHE
2	D	353	LYS
2	D	385	LEU
2	D	403	SER
2	D	431	ASP
2	D	479	PHE
2	D	524	SER
2	D	539	SER
2	D	555	LEU
1	B	234	VAL
1	B	256	ARG
1	B	296	ASP
1	B	303	GLU
1	B	316	ARG
1	B	357	VAL
1	B	381	ILE
1	B	391	GLU
1	B	436	ASN
1	B	452	ILE
1	B	482	ASP
1	B	503	CYS
1	B	593	CYS
1	B	597	ASP
1	B	599	LEU
1	B	620	GLU
1	B	643	GLU
1	B	664	LEU
1	B	674	PHE
2	E	126	ASN
2	E	175	PHE
2	E	238	SER
2	E	294	GLN
2	E	299	VAL
2	E	302	LEU

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Mol	Chain	Res	Type
2	E	314	PHE
2	E	320	LYS
2	E	325	GLU
2	E	353	LYS
2	E	362	TRP
2	E	385	LEU
2	E	404	SER
2	E	405	SER
2	E	431	ASP
2	E	479	PHE
2	E	544	ASN
2	E	555	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	377	ASN
2	D	333	ASN
1	B	280	GLN
2	E	333	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 20 ligands modelled in this entry, 8 are monoatomic - leaving 12 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	D	603	2	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	B	804	1	14,14,15	0.17	0	17,19,21	0.63	0
4	NAG	A	804	1	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	B	805	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	E	602	2	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	B	806	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	A	806	1	14,14,15	0.22	0	17,19,21	0.42	0
4	NAG	E	604	2	14,14,15	0.21	0	17,19,21	0.42	0
4	NAG	D	602	2	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	D	604	2	14,14,15	0.24	0	17,19,21	0.43	0
4	NAG	A	805	1	14,14,15	0.23	0	17,19,21	0.50	0
4	NAG	E	603	2	14,14,15	0.21	0	17,19,21	0.42	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	D	603	2	-	0/6/23/26	0/1/1/1
4	NAG	B	804	1	-	3/6/23/26	0/1/1/1
4	NAG	A	804	1	-	4/6/23/26	0/1/1/1
4	NAG	B	805	1	-	4/6/23/26	0/1/1/1
4	NAG	E	602	2	-	4/6/23/26	0/1/1/1
4	NAG	B	806	1	-	2/6/23/26	0/1/1/1
4	NAG	A	806	1	-	0/6/23/26	0/1/1/1
4	NAG	E	604	2	-	0/6/23/26	0/1/1/1
4	NAG	D	602	2	-	2/6/23/26	0/1/1/1
4	NAG	D	604	2	-	0/6/23/26	0/1/1/1
4	NAG	A	805	1	-	4/6/23/26	0/1/1/1
4	NAG	E	603	2	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	804	NAG	O5-C5-C6-O6
4	B	804	NAG	O5-C5-C6-O6
4	B	806	NAG	O5-C5-C6-O6
4	B	804	NAG	C4-C5-C6-O6
4	A	804	NAG	C8-C7-N2-C2
4	A	804	NAG	O7-C7-N2-C2
4	A	805	NAG	C8-C7-N2-C2
4	A	805	NAG	O7-C7-N2-C2
4	D	602	NAG	C8-C7-N2-C2
4	D	602	NAG	O7-C7-N2-C2
4	B	805	NAG	C8-C7-N2-C2
4	B	805	NAG	O7-C7-N2-C2
4	E	602	NAG	C8-C7-N2-C2
4	E	602	NAG	O7-C7-N2-C2
4	E	602	NAG	O5-C5-C6-O6
4	B	806	NAG	C4-C5-C6-O6
4	E	603	NAG	O5-C5-C6-O6
4	A	804	NAG	C4-C5-C6-O6
4	A	805	NAG	O5-C5-C6-O6
4	B	805	NAG	O5-C5-C6-O6
4	E	602	NAG	C4-C5-C6-O6
4	E	603	NAG	C4-C5-C6-O6
4	A	805	NAG	C4-C5-C6-O6
4	B	805	NAG	C4-C5-C6-O6
4	B	804	NAG	C3-C2-N2-C7

There are no ring outliers.

3 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	804	NAG	1	0
4	B	806	NAG	10	0
4	D	604	NAG	1	0

## 5.7 Other polymers [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	484/486 (99%)	0.35	17 (3%) 44 42	50, 82, 131, 193	0
1	B	484/486 (99%)	0.43	19 (3%) 39 39	46, 76, 123, 162	0
2	D	516/526 (98%)	0.87	76 (14%) 2 2	52, 92, 205, 245	0
2	E	516/526 (98%)	1.42	118 (22%) 0 0	60, 105, 246, 279	0
All	All	2000/2024 (98%)	0.78	230 (11%) 4 4	46, 87, 211, 279	0

All (230) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	88	ASN	15.8
2	E	78	GLY	13.8
2	E	71	SER	13.8
2	E	96	LEU	12.3
2	E	44	ALA	11.7
2	E	72	LEU	10.6
2	E	122	ILE	10.6
2	E	59	ARG	10.2
2	E	89	ALA	9.7
2	E	74	PHE	9.6
2	E	93	LEU	9.0
2	D	87	PHE	8.9
2	E	58	ALA	8.5
2	E	113	GLY	8.4
2	E	117	LEU	8.0
2	E	70	ILE	7.3
2	E	104	ASP	7.2
2	E	165	LEU	7.2
2	E	98	PHE	7.2
2	E	214	LEU	7.2
2	D	192	ASN	7.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	D	113	GLY	6.9
2	E	215	SER	6.9
2	E	57	ASN	6.8
2	E	146	LEU	6.6
2	D	165	LEU	6.3
2	D	215	SER	6.2
2	E	87	PHE	6.2
2	D	61	ILE	6.1
2	E	170	LEU	6.0
2	D	204	PRO	6.0
2	D	106	ILE	5.9
2	E	63	ARG	5.9
2	E	64	THR	5.8
2	E	69	VAL	5.8
2	E	137	GLY	5.8
2	D	214	LEU	5.8
2	E	53	ALA	5.7
2	E	265	TRP	5.6
2	E	80	THR	5.4
2	E	196	GLU	5.4
2	E	109	ASP	5.4
2	D	57	ASN	5.3
2	D	208	LYS	5.3
2	E	76	ARG	5.1
2	D	93	LEU	5.1
2	E	83	SER	5.0
2	D	84	GLU	4.9
2	E	79	PHE	4.9
2	E	45	VAL	4.9
2	D	63	ARG	4.9
2	E	102	SER	4.8
2	D	68	ASP	4.8
2	E	105	VAL	4.8
1	B	481	GLN	4.7
2	D	54	LEU	4.7
2	E	246	ASN	4.7
2	E	193	ALA	4.7
2	E	90	THR	4.6
2	D	72	LEU	4.6
2	E	41	LYS	4.6
2	E	95	LEU	4.6
2	E	188	LEU	4.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	675	ASN	4.5
2	E	195	VAL	4.5
2	E	192	ASN	4.4
2	D	122	ILE	4.4
2	D	132	ARG	4.4
2	D	496	TYR	4.4
2	D	130	ILE	4.4
2	E	143	HIS	4.3
2	D	69	VAL	4.3
2	E	159	PHE	4.3
2	E	126	ASN	4.3
2	D	170	LEU	4.3
2	E	154	LEU	4.2
2	E	163	ASP	4.1
2	D	213	SER	4.1
2	D	74	PHE	4.1
2	D	103	PHE	4.1
2	D	79	PHE	4.1
2	E	103	PHE	4.1
2	D	205	GLU	4.0
2	D	490	ALA	4.0
2	E	144	LEU	4.0
2	D	62	PRO	4.0
2	E	376	TRP	3.9
2	D	162	LEU	3.8
2	D	41	LYS	3.8
2	E	55	CYS	3.8
2	D	272	PHE	3.8
2	D	127	ILE	3.8
1	A	662	MET	3.7
2	E	316	ASN	3.7
2	E	184	LEU	3.7
2	E	91	PRO	3.7
2	E	77	SER	3.7
2	E	112	ILE	3.7
2	E	111	PHE	3.6
2	E	60	SER	3.6
2	D	135	PHE	3.6
2	E	120	LEU	3.6
2	D	146	LEU	3.5
2	D	154	LEU	3.5
2	E	131	SER	3.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	E	121	PHE	3.4
2	D	175	PHE	3.4
2	D	70	ILE	3.4
2	E	61	ILE	3.4
1	B	439	SER	3.4
1	B	476	LYS	3.4
2	D	265	TRP	3.4
2	D	218	ASP	3.3
2	D	55	CYS	3.3
2	D	50	LYS	3.3
2	E	141	LEU	3.3
2	E	67	PRO	3.2
1	B	398	TRP	3.2
2	E	114	LEU	3.2
2	E	490	ALA	3.2
2	D	67	PRO	3.2
2	E	175	PHE	3.2
2	E	115	PRO	3.2
2	D	71	SER	3.2
2	E	272	PHE	3.2
2	D	112	ILE	3.1
2	E	106	ILE	3.1
2	D	117	LEU	3.1
2	E	162	LEU	3.1
1	B	543	PHE	3.1
2	D	83	SER	3.1
2	D	105	VAL	3.1
2	E	84	GLU	3.1
2	E	190	HIS	3.1
2	E	395	ARG	3.0
2	E	208	LYS	3.0
1	B	336	GLU	3.0
2	D	98	PHE	3.0
2	D	217	LYS	2.9
1	B	382	SER	2.9
1	B	452	ILE	2.9
2	E	153	THR	2.9
1	A	486	SER	2.9
1	B	625	LEU	2.9
2	E	97	LEU	2.9
2	D	128	LYS	2.9
2	E	416	ALA	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	669	LEU	2.9
2	D	276	ASP	2.9
1	B	335	PHE	2.8
2	E	52	ASN	2.8
2	D	58	ALA	2.8
2	D	111	PHE	2.8
2	D	65	VAL	2.8
2	E	275	TYR	2.8
2	E	273	ARG	2.7
2	E	86	SER	2.7
1	A	256	ARG	2.7
2	E	129	SER	2.7
1	A	476	LYS	2.7
2	E	116	HIS	2.7
2	D	159	PHE	2.6
2	E	56	GLU	2.6
1	B	669	LEU	2.6
2	E	271	THR	2.6
2	D	56	GLU	2.6
1	A	625	LEU	2.5
2	E	204	PRO	2.5
1	A	606	THR	2.5
2	D	96	LEU	2.5
2	E	219	PHE	2.5
2	E	207	LYS	2.5
1	A	664	LEU	2.5
1	B	440	LYS	2.5
1	B	662	MET	2.5
2	D	91	PRO	2.5
2	E	145	SER	2.5
2	E	148	ASN	2.5
2	E	85	GLY	2.4
1	A	644	GLU	2.4
2	E	81	GLU	2.4
2	D	75	VAL	2.4
2	E	92	SER	2.4
2	E	68	ASP	2.4
2	D	181	LEU	2.4
2	E	51	ASP	2.4
2	E	139	LYS	2.4
2	D	207	LYS	2.3
1	B	293	TRP	2.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	D	187	TRP	2.3
2	D	89	ALA	2.3
1	A	676	PHE	2.3
1	B	666	HIS	2.3
2	D	64	THR	2.3
2	D	140	SER	2.3
2	D	174	SER	2.3
2	D	487	TYR	2.3
2	E	517	LEU	2.3
2	D	212	ASN	2.3
1	A	590	TRP	2.2
1	B	629	GLN	2.2
2	E	176	ASN	2.2
1	A	543	PHE	2.2
2	E	244	TYR	2.2
2	E	181	LEU	2.2
1	B	367	ALA	2.2
1	A	438	PRO	2.2
2	E	123	GLU	2.2
2	D	191	THR	2.2
2	E	128	LYS	2.2
2	D	275	TYR	2.2
2	E	187	TRP	2.1
1	A	626	VAL	2.1
1	B	455	GLY	2.1
2	E	429	MET	2.1
1	B	603	LEU	2.1
2	E	237	LEU	2.1
2	E	496	TYR	2.1
2	E	329	ILE	2.1
2	E	130	ILE	2.1
2	E	135	PHE	2.1
1	A	485	CYS	2.1
2	D	133	HIS	2.0
2	D	314	PHE	2.1
2	E	191	THR	2.0
2	D	92	SER	2.0
2	E	211	ILE	2.0
2	E	385	LEU	2.0
2	D	44	ALA	2.0
1	A	602	TYR	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
4	NAG	A	806	14/15	0.02	0.93	170,187,194,196	0
4	NAG	B	806	14/15	0.27	0.60	134,140,144,145	0
4	NAG	D	604	14/15	0.29	1.39	181,195,208,221	0
4	NAG	E	603	14/15	0.30	1.05	207,215,221,221	0
4	NAG	E	604	14/15	0.62	0.70	152,159,167,168	0
4	NAG	B	805	14/15	0.65	0.32	142,149,152,153	0
4	NAG	D	603	14/15	0.66	0.96	153,161,168,170	0
4	NAG	E	602	14/15	0.67	0.42	120,131,141,142	0
4	NAG	A	805	14/15	0.74	0.21	112,122,125,128	0
3	CA	B	801	1/1	0.81	0.07	105,105,105,105	0
4	NAG	D	602	14/15	0.84	0.21	87,102,111,113	0
3	CA	A	802	1/1	0.85	0.12	115,115,115,115	0
3	CA	E	601	1/1	0.85	0.09	114,114,114,114	0
3	CA	D	601	1/1	0.86	0.11	97,97,97,97	0
4	NAG	A	804	14/15	0.88	0.20	109,113,121,130	0
3	CA	A	801	1/1	0.90	0.07	92,92,92,92	0
3	CA	B	803	1/1	0.90	0.07	124,124,124,124	0
4	NAG	B	804	14/15	0.91	0.17	87,97,103,104	0
3	CA	B	802	1/1	0.95	0.10	64,64,64,64	0
3	CA	A	803	1/1	0.97	0.07	62,62,62,62	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.