WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jan 15, 2025 – 02:06 PM EST

PDB ID	:	7SX6
Title	:	Crystal structure of broadly neutralizing antibody N49P9.3 Fab in complex with HIV-1 Clade A/E strain 93TH057 gp120 core
Authors	:	Tolbert, W.D.; Pazgier, M.
Deposited on	:	2021-11-22
Resolution	:	3.40 Å(reported)

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

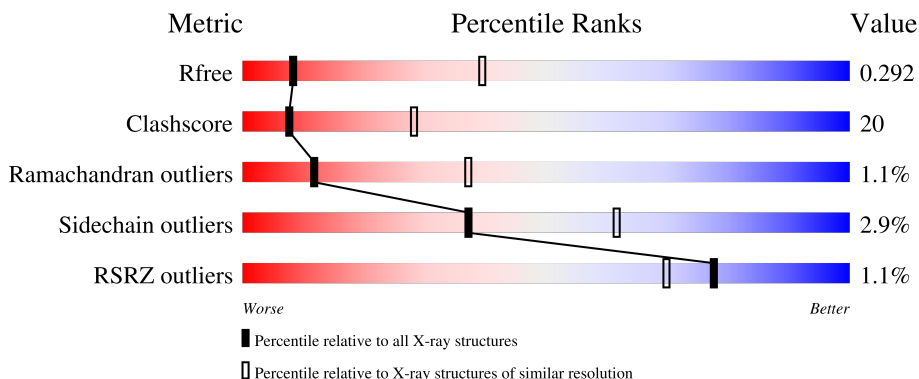|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 3.40 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.
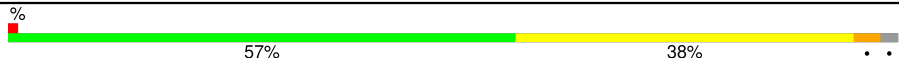

Metric	Percentile Ranks	Value
Rfree		0.292
Clashscore		20
Ramachandran outliers		1.1%
Sidechain outliers		2.9%
RSRZ outliers		1.1%

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$_{free}$	164625	1140 (3.46-3.34)
Clashscore	180529	1172 (3.46-3.34)
Ramachandran outliers	177936	1172 (3.46-3.34)
Sidechain outliers	177891	1172 (3.46-3.34)
RSRZ outliers	164620	1140 (3.46-3.34)

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	355	57% 38%
1	G	355	65% 30%
2	B	223	54% 40%
2	H	223	60% 34%
3	C	203	61% 34%

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Mol	Chain	Length	Quality of chain
3	L	203	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	CL	A	511	-	-	X	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 11995 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 clade A/E 93TH057 HIV-1 gp120 core.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	346	Total 2706	C 1695	N 469	O 519	S 23	0	0	0
1	A	346	Total 2706	C 1695	N 469	O 519	S 23	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	42	VAL	-	expression tag	UNP A0A0M3KKW9
G	43	PRO	-	expression tag	UNP A0A0M3KKW9
G	375	SER	HIS	engineered mutation	UNP A0A0M3KKW9
A	42	VAL	-	expression tag	UNP A0A0M3KKW9
A	43	PRO	-	expression tag	UNP A0A0M3KKW9
A	375	SER	HIS	engineered mutation	UNP A0A0M3KKW9

- Molecule 2 is a protein called N49P9.3 ANTIBODY FAB HEAVY CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	213	Total 1646	C 1048	N 283	O 305	S 10	0	0	0
2	B	213	Total 1646	C 1048	N 283	O 305	S 10	0	0	0

- Molecule 3 is a protein called N49P9.3 ANTIBODY FAB LIGHT CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	L	199	Total 1503	C 947	N 253	O 298	S 5	0	0	0
3	C	199	Total 1503	C 947	N 253	O 298	S 5	0	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:

$C_8H_{15}NO_6$).
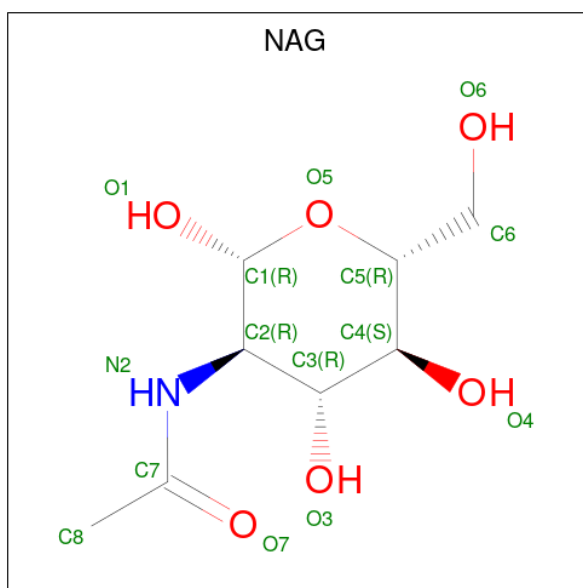
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	G	1	Total 14	C 8	N 1	O 5	0	0
4	A	1	Total 14	C 8	N 1	O 5	0	0
4	A	1	Total 14	C 8	N 1	O 5	0	0
4	A	1	Total 14	C 8	N 1	O 5	0	0

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

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	G	1	Total 1	Cl 1	0	0
5	A	1	Total 1	Cl 1	0	0

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

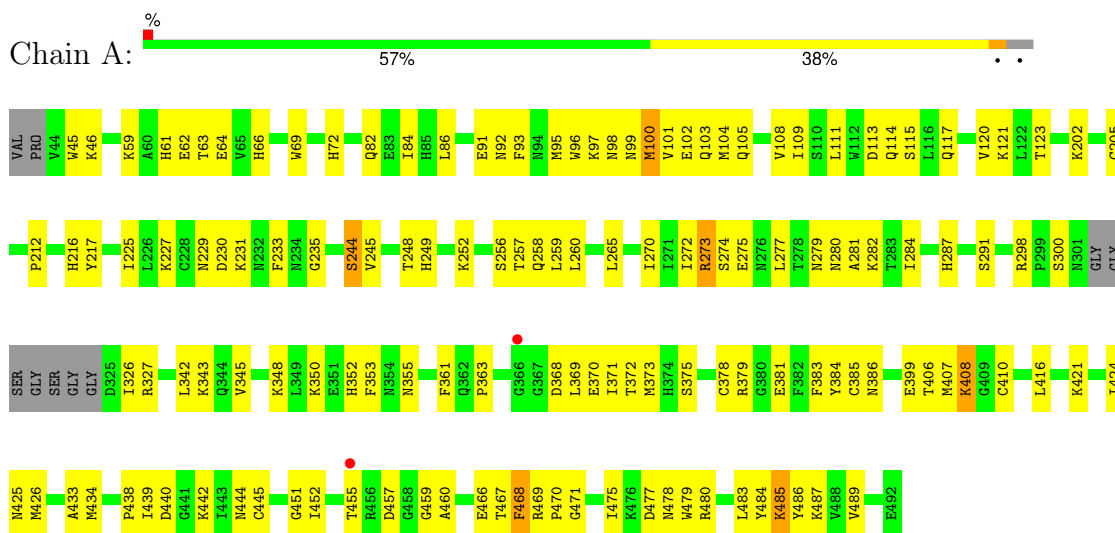| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	G	2	Total 2	Mg 2	0	0
6	A	1	Total 1	Mg 1	0	0

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.
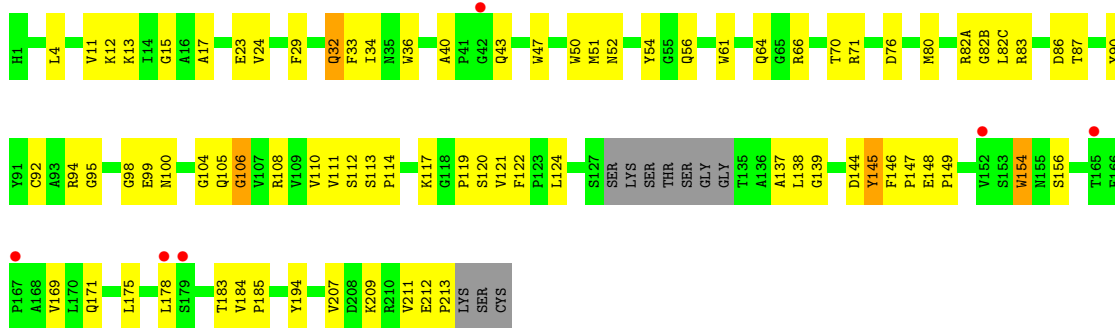
• Molecule 1: clade A/E 93TH057 HIV-1 gp120 core

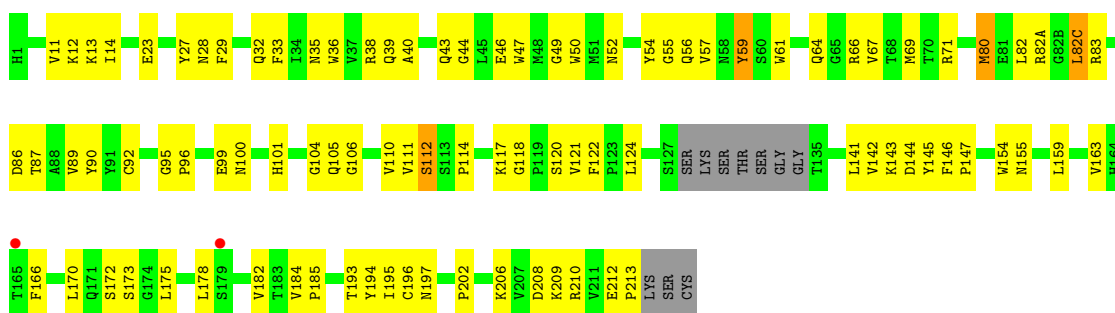• Molecule 1: clade A/E 93TH057 HIV-1 gp120 core

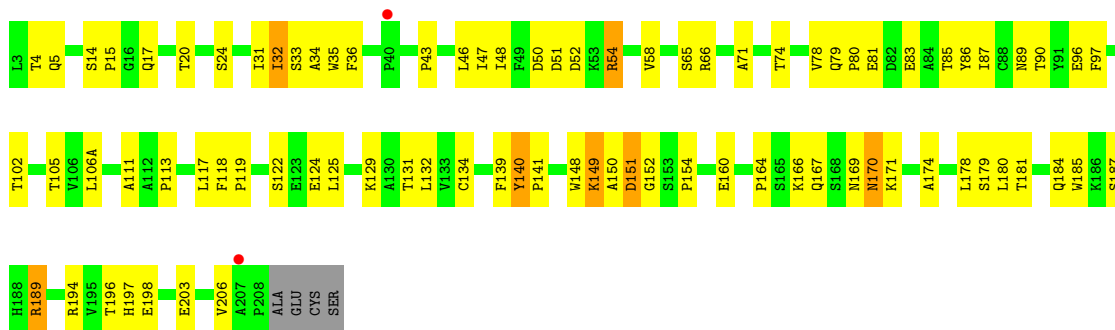• Molecule 2: N49P9.3 ANTIBODY FAB HEAVY CHAIN

H1 L4 V11 K12 K13 I14 G15 A16 A17 E23 V24 F29 Q32 F33 I34 N35 W36 A40 P41 G42 Q43 W47 W50 M51 N52 Y54 G55 Q56 W61 Q64 G65 R66 T70 R71 D76 M80 R82A G82B L82C R83 D86 T87 Y90

Y91 C92 A93 R94 G95 G98 E99 N100 G104 Q105 G106 V107 R108 V109 V110 V111 S112 S113 P114 K117 G118 P119 S120 V121 F122 P123 L124 S127 SER LYS SER THR SER GLY GLY T135 A136 A137 L138 G139 D144 Y145 F146 P147 E148 P149 V152 S153 W154 N155 S156 T165 F166

P167 A168 V169 L170 Q171 L175 L178 S179 T183 V184 P185 Y194 V207 D208 K209 R210 V211 E212 P213 LYS SER CYS

● Molecule 2: N49P9.3 ANTIBODY FAB HEAVY CHAIN

%

Chain B:　　54%　　40%　· ·

H1 V11 K12 K13 I14 E23 Y27 N28 F29 Q32 F33 I34 N35 W36 V37 R38 Q39 A40 Q43 G44 L45 E46 W47 M48 G49 W50 M51 N52 Y54 G55 Q56 V57 N58 Y59 S60 W61 Q64 G65 R66 V67 T68 M69 T70 R71 M80 E81 L82 R82A G82B L82C R83

D86 T87 A88 V89 Y90 Y91 C92 G95 P96 E99 N100 H101 G104 Q105 G106 V110 V111 S112 S113 P114 K117 G118 P119 S120 V121 F122 P123 L124 S127 SER LYS SER THR SER GLY GLY T135 L141 V142 K143 D144 Y145 F146 P147 W154 N155 L159 V163 H164

T165 F166 L170 Q171 S172 S173 G174 L175 L178 S179 V182 T183 V184 P185 T193 Y194 I195 C196 N197 P202 K206 V207 D208 K209 R210 V211 E212 P213 LYS SER CYS

● Molecule 3: N49P9.3 ANTIBODY FAB LIGHT CHAIN

%

Chain L:　　57%　　38%　· ·

L3 T4 Q5 S14 P15 G16 Q17 T20 S24 I31 I32 S33 A34 W35 F36 P40 P43 L46 I47 I48 F49 D50 D51 D52 K53 R54 V58 S65 R66 A71 T74 V78 Q79 P80 E81 D82 E83 A84 T85 Y86 I87 C88 N89 T90 Y91 E96 F97

T102 T105 V106 L106A A111 A112 P113 L117 F118 P119 S122 E123 E124 L125 K129 A130 T131 L132 V133 C134 F139 Y140 P141 W148 K149 A150 D151 G152 S153 P154 E160 P164 S165 K166 Q167 S168 N169 N170 K171 A174 L178 S179 L180 T181 Q184 W185 K186 S187

H188 R189 R194 V195 T196 H197 E198 E203 V206 A207 P208 ALA GLU CYS SER

● Molecule 3: N49P9.3 ANTIBODY FAB LIGHT CHAIN

%

Chain C:　　61%　　34%　· ·

L3 T4 Q5 P6 S24 I32 S33 Q38 K42 P43 L46 I47 I48 F49 D50 D51 R54 P55 S60 R66 T70 V78 Q79 P80 E81 D82 E83 Y86 I87 C88 N89 T90 Y91 E96 F97 F98 G99 T102 T105 V106 Q108 A111 A112 P113 S114

V115 F118 E124 A127 N128 K129 L132 V133 C134 L135 V136 S137 D138 F139 G142 K149 A150 D151 G152 G158 K163 P164 S165 K166 Q167 K171 K172 A173 A174 S175 L178 S179 L180 T181 P182 E183 Q184 W185 K186 Y191 V195 T196 H197 S200 K204

P208 ALA GLU CYS SER

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	62.21Å 68.21Å 115.06Å 90.26° 102.35° 90.38°	Depositor
Resolution (Å)	35.46 – 3.40 35.46 – 3.40	Depositor EDS
% Data completeness (in resolution range)	94.9 (35.46-3.40) 95.5 (35.46-3.40)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.03 (at 3.33Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.240 , 0.292 0.239 , 0.292	Depositor DCC
R_{free} test set	1268 reflections (5.12%)	wwPDB-VP
Wilson B-factor (Å^2)	129.8	Xtriage
Anisotropy	0.112	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 253.1	EDS
L-test for twinning[2]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.438 for -h,k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	11995	wwPDB-VP
Average B, all atoms (Å^2)	153.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.46% 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: NAG, CL, MG

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	#$\vert Z \vert$ >5	RMSZ	#$\vert Z \vert$ >5
1	A	0.29	0/2762	0.54	0/3748
1	G	0.30	0/2762	0.53	0/3748
2	B	0.30	0/1693	0.64	0/2308
2	H	0.30	0/1693	0.59	0/2308
3	C	0.31	0/1543	0.61	0/2106
3	L	0.39	0/1543	0.63	0/2106
All	All	0.31	0/11996	0.58	0/16324

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 ⓘ

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	2706	0	2638	119	0
1	G	2706	0	2638	102	0
2	B	1646	0	1594	78	0
2	H	1646	0	1594	74	0
3	C	1503	0	1473	56	0
3	L	1503	0	1473	65	0
4	A	140	0	130	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	G	140	0	130	2	0
5	A	1	0	0	3	0
5	G	1	0	0	1	0
6	A	1	0	0	0	0
6	G	2	0	0	0	0
All	All	11995	0	11670	467	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 20.

All (467) 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:G:369:LEU:HA	1:G:372:THR:HG22	1.41	0.98
1:G:421:LYS:NZ	5:G:511:CL:CL	2.34	0.97
3:L:141:PRO:HD2	3:L:198:GLU:OE2	1.70	0.90
2:B:143:LYS:NZ	2:B:144:ASP:OD2	2.06	0.88
2:H:54:TYR:HB2	2:H:56:GLN:HE22	1.38	0.88
2:B:87:THR:HG23	2:B:110:VAL:HA	1.56	0.87
1:A:69:TRP:HA	1:A:72:HIS:HE1	1.38	0.86
3:C:79:GLN:HB2	3:C:80:PRO:HD3	1.57	0.85
2:H:82(C):LEU:HD13	2:H:111:VAL:HG22	1.59	0.84
1:A:69:TRP:HA	1:A:72:HIS:CE1	2.14	0.83
1:A:120:VAL:HG12	1:A:434:MET:HB3	1.62	0.82
3:L:54:ARG:HE	3:L:58:VAL:HG23	1.45	0.81
2:H:82(C):LEU:O	2:H:82(C):LEU:HD12	1.81	0.80
1:A:273:ARG:HH12	1:A:287:HIS:HB2	1.46	0.80
2:B:54:TYR:HB2	2:B:56:GLN:HE22	1.47	0.80
3:L:35:TRP:HD1	3:L:48:ILE:HD11	1.45	0.79
3:L:15:PRO:HA	3:L:78:VAL:HB	1.65	0.79
3:L:35:TRP:HB2	3:L:48:ILE:HG12	1.66	0.77
3:L:106(A):LEU:HA	3:L:140:TYR:OH	1.85	0.77
1:G:104:MET:HE1	1:G:479:TRP:CD2	2.20	0.76
1:A:350:LYS:HE3	1:A:355:ASN:HD22	1.50	0.75
1:A:121:LYS:NZ	1:A:123:THR:OG1	2.20	0.75
1:A:342:LEU:HD11	1:A:361:PHE:HE2	1.51	0.75
2:H:11:VAL:HG12	2:H:110:VAL:HB	1.69	0.74
2:B:11:VAL:O	2:B:12:LYS:HE2	1.87	0.74
3:C:115:VAL:O	3:C:204:LYS:NZ	2.20	0.74
3:L:83:GLU:HG3	3:L:105:THR:HA	1.69	0.73
1:G:463:THR:HG22	1:G:464:SER:H	1.53	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:105:GLN:OE1	1:A:479:TRP:NE1	2.20	0.72
2:H:87:THR:HG23	2:H:110:VAL:HA	1.71	0.72
2:H:66:ARG:HD2	2:H:82(B):GLY:O	1.90	0.71
2:H:146:PHE:CD1	2:H:147:PRO:HA	2.26	0.71
2:H:32:GLN:HG3	2:H:94:ARG:HH21	1.56	0.70
2:H:83:ARG:O	2:H:111:VAL:HG11	1.92	0.69
1:G:47:ASP:HA	1:G:489:VAL:HG23	1.75	0.69
2:B:61:TRP:HA	2:B:64:GLN:HE21	1.57	0.69
1:G:245:VAL:HG22	1:G:247:CYS:H	1.58	0.69
2:H:66:ARG:HG3	2:H:82(A):ARG:O	1.91	0.69
1:A:95:MET:HE1	1:A:273:ARG:HD3	1.75	0.69
2:H:119:PRO:HB3	2:H:145:TYR:HB3	1.75	0.69
1:A:371:ILE:HG13	2:B:56:GLN:HE21	1.57	0.69
3:C:54:ARG:HH12	3:C:60:SER:HA	1.57	0.69
1:G:62:GLU:HG3	1:G:64:GLU:H	1.56	0.69
1:G:50:THR:O	1:G:103:GLN:NE2	2.25	0.68
2:H:61:TRP:HA	2:H:64:GLN:HE21	1.58	0.68
2:B:163:VAL:HG23	2:B:182:VAL:HG22	1.75	0.68
2:H:105:GLN:HA	3:L:43:PRO:HG2	1.74	0.68
1:A:369:LEU:HA	1:A:372:THR:HG22	1.75	0.68
2:H:82(C):LEU:HD13	2:H:111:VAL:CG2	2.23	0.68
2:H:83:ARG:N	2:H:86:ASP:OD2	2.24	0.68
3:C:139:PHE:O	3:C:172:TYR:HB2	1.94	0.67
3:L:5:GLN:NE2	3:L:86:TYR:O	2.27	0.67
1:G:369:LEU:O	1:G:371:ILE:N	2.27	0.67
2:B:159:LEU:HD21	2:B:182:VAL:HG11	1.76	0.67
2:H:61:TRP:HA	2:H:64:GLN:NE2	2.10	0.67
2:B:144:ASP:HA	2:B:175:LEU:HG	1.77	0.67
1:A:101:VAL:HG13	1:A:479:TRP:HB2	1.76	0.66
3:L:178:LEU:HD13	3:L:180:LEU:HD13	1.76	0.66
1:A:95:MET:CE	1:A:273:ARG:HD3	2.25	0.66
3:L:34:ALA:HB3	3:L:89:ASN:HB3	1.78	0.66
3:C:124:GLU:HG3	3:C:129:LYS:HB2	1.76	0.66
1:G:399:GLU:O	1:G:408:LYS:NZ	2.29	0.65
1:A:298:ARG:NH1	1:A:439:ILE:O	2.29	0.65
3:L:32:ILE:HG22	3:L:33:SER:H	1.62	0.65
3:C:166:LYS:NZ	3:C:167:GLN:O	2.27	0.65
2:B:32:GLN:NE2	2:B:96:PRO:O	2.30	0.64
1:G:378:CYS:HB3	1:G:383:PHE:CE2	2.32	0.64
2:H:13:LYS:HD2	2:H:114:PRO:HA	1.78	0.64
2:H:171:GLN:NE2	2:H:175:LEU:O	2.31	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:98:ASN:OD1	1:G:100:MET:HG3	1.98	0.64
1:A:265:LEU:HD21	1:A:291:SER:HB3	1.78	0.64
1:G:273:ARG:HH12	1:G:287:HIS:HB2	1.63	0.64
2:H:212:GLU:HG3	2:H:213:PRO:HD2	1.79	0.64
1:A:421:LYS:NZ	5:A:511:CL:CL	2.68	0.64
1:A:385:CYS:HB3	1:A:416:LEU:HD11	1.80	0.63
3:L:47:ILE:HG22	3:L:58:VAL:HG11	1.79	0.63
1:A:59:LYS:HB3	1:A:61:HIS:CE1	2.34	0.63
1:A:327:ARG:NH1	5:A:511:CL:CL	2.68	0.63
1:A:378:CYS:HB3	1:A:383:PHE:HE2	1.63	0.63
1:A:257:THR:HG1	1:A:375:SER:H	1.44	0.62
2:B:66:ARG:NH2	2:B:86:ASP:OD2	2.32	0.62
1:A:59:LYS:HD3	1:A:61:HIS:HE1	1.63	0.62
2:B:210:ARG:NH1	2:B:212:GLU:OE1	2.23	0.62
1:A:82:GLN:N	1:A:82:GLN:OE1	2.33	0.62
1:G:300:SER:H	1:G:442:LYS:HD2	1.65	0.62
1:A:477:ASP:OD1	1:A:480:ARG:NH1	2.32	0.62
1:G:104:MET:CE	1:G:479:TRP:CG	2.83	0.62
1:A:368:ASP:OD2	2:B:71:ARG:NH2	2.33	0.62
1:G:259:LEU:HD12	1:G:374:HIS:CE1	2.35	0.61
1:G:50:THR:HG21	1:G:223:TYR:CD2	2.35	0.61
3:C:32:ILE:HG22	3:C:33:SER:H	1.65	0.61
1:A:95:MET:CE	1:A:235:GLY:HA3	2.30	0.61
1:A:372:THR:HG23	1:A:373:MET:HG3	1.83	0.61
3:C:79:GLN:HB2	3:C:80:PRO:CD	2.30	0.61
3:C:33:SER:HB3	3:C:66:ARG:HD3	1.83	0.60
1:A:378:CYS:HB3	1:A:383:PHE:CE2	2.35	0.60
3:L:194:ARG:NH1	3:L:196:THR:OG1	2.34	0.60
2:H:82(C):LEU:HD12	2:H:82(C):LEU:C	2.22	0.59
3:C:78:VAL:HG13	3:C:82:ASP:HB2	1.83	0.59
1:G:104:MET:CG	1:G:217:TYR:HE2	2.15	0.59
3:L:54:ARG:NH2	3:L:58:VAL:O	2.22	0.59
1:A:62:GLU:HG3	1:A:64:GLU:H	1.67	0.59
1:A:459:GLY:HA2	3:C:96:GLU:HG3	1.83	0.59
3:C:150:ALA:O	3:C:152:GLY:N	2.35	0.59
1:A:350:LYS:HE3	1:A:355:ASN:ND2	2.15	0.59
3:L:164:PRO:HB3	3:L:174:ALA:HB2	1.83	0.59
2:B:66:ARG:HH21	2:B:82(C):LEU:HA	1.67	0.59
1:A:95:MET:HE2	1:A:235:GLY:HA3	1.83	0.59
1:G:298:ARG:NH2	1:G:439:ILE:O	2.36	0.59
2:H:112:SER:HB2	2:H:146:PHE:CZ	2.38	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:5:GLN:OE1	3:C:88:CYS:N	2.31	0.59
1:A:466:GLU:HB3	1:A:468:PHE:HE1	1.68	0.58
2:B:121:VAL:HG22	2:B:142:VAL:HG12	1.83	0.58
2:B:117:LYS:HD2	2:B:118:GLY:N	2.18	0.58
1:G:357:LYS:NZ	1:G:463:THR:O	2.36	0.58
1:G:337:LYS:O	1:G:341:VAL:HG23	2.04	0.57
3:L:187:SER:O	3:L:189:ARG:NH1	2.35	0.57
2:B:99:GLU:OE1	2:B:99:GLU:N	2.37	0.57
3:C:83:GLU:HG3	3:C:105:THR:HA	1.85	0.57
1:A:444:ASN:OD1	1:A:445:CYS:N	2.38	0.57
2:B:184:VAL:HG12	2:B:185:PRO:HD2	1.87	0.57
1:G:69:TRP:HA	1:G:72:HIS:CE1	2.40	0.57
3:L:139:PHE:HB2	3:L:197:HIS:CE1	2.40	0.57
1:G:46:LYS:NZ	1:G:492:GLU:OXT	2.35	0.57
1:G:104:MET:CG	1:G:217:TYR:CE2	2.88	0.57
1:A:343:LYS:O	1:A:343:LYS:HD3	2.05	0.57
3:C:181:THR:HG22	3:C:183:GLU:H	1.70	0.57
2:B:196:CYS:O	2:B:208:ASP:HA	2.04	0.56
1:G:425:ASN:HB2	2:H:54:TYR:HE1	1.69	0.56
1:A:258:GLN:HG2	1:A:470:PRO:HB2	1.88	0.56
1:G:286:VAL:HB	1:G:452:ILE:HB	1.87	0.56
1:G:101:VAL:HG23	1:G:479:TRP:HB2	1.87	0.56
2:H:121:VAL:HG11	2:H:207:VAL:HG21	1.87	0.56
2:B:59:TYR:HE2	2:B:69:MET:HG3	1.69	0.56
1:G:98:ASN:O	1:G:101:VAL:HG12	2.05	0.56
1:A:363:PRO:O	1:A:469:ARG:NH1	2.38	0.56
2:B:206:LYS:NZ	2:B:208:ASP:OD2	2.24	0.56
1:G:104:MET:CE	1:G:479:TRP:CD2	2.89	0.56
2:H:12:LYS:NZ	2:H:17:ALA:O	2.39	0.56
2:H:105:GLN:C	3:L:43:PRO:HG3	2.26	0.56
1:A:46:LYS:HD2	1:A:46:LYS:N	2.21	0.56
1:A:277:LEU:HD13	1:A:353:PHE:HE1	1.71	0.56
1:A:216:HIS:ND1	1:A:248:THR:O	2.35	0.56
1:A:230:ASP:HB2	1:A:233:PHE:HB2	1.88	0.55
2:B:43:GLN:HG2	2:B:44:GLY:H	1.70	0.55
3:C:90:THR:O	3:C:97:PHE:HB2	2.06	0.55
3:C:136:VAL:HG11	3:C:195:VAL:HG21	1.87	0.55
1:G:104:MET:HG3	1:G:217:TYR:CE2	2.42	0.55
1:G:104:MET:HG3	1:G:217:TYR:HE2	1.72	0.55
1:A:212:PRO:O	1:A:252:LYS:NZ	2.40	0.55
1:G:67:ASN:HD21	1:G:213:ILE:HG21	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:54:TYR:HB2	2:H:56:GLN:NE2	2.17	0.55
2:B:195:ILE:HD13	2:B:197:ASN:HD21	1.70	0.55
2:B:39:GLN:HB3	2:B:89:VAL:HG22	1.88	0.55
1:G:327:ARG:HG3	1:G:327:ARG:HH11	1.71	0.55
2:B:47:TRP:HZ2	2:B:50:TRP:HD1	1.53	0.55
1:G:281:ALA:HB1	2:H:33:PHE:HE2	1.72	0.55
2:H:40:ALA:HB3	2:H:43:GLN:HB3	1.89	0.54
2:B:13:LYS:NZ	2:B:114:PRO:HA	2.22	0.54
1:A:279:ASN:OD1	1:A:281:ALA:N	2.39	0.54
2:B:71:ARG:HH11	2:B:71:ARG:HG2	1.72	0.54
3:L:134:CYS:HB2	3:L:148:TRP:CH2	2.42	0.54
1:A:406:THR:O	1:A:408:LYS:N	2.39	0.54
2:B:82(C):LEU:HD13	2:B:111:VAL:HG22	1.89	0.54
2:H:52:ASN:HB3	2:H:56:GLN:HB2	1.89	0.54
2:H:184:VAL:HG22	2:H:185:PRO:HD3	1.90	0.54
1:A:421:LYS:HG2	5:A:511:CL:CL	2.45	0.54
3:L:198:GLU:N	3:L:198:GLU:OE1	2.41	0.54
3:C:111:ALA:HB3	3:C:171:LYS:NZ	2.23	0.54
3:L:169:ASN:OD1	3:L:171:LYS:HG2	2.07	0.53
1:A:217:TYR:O	1:A:248:THR:HG23	2.07	0.53
2:B:193:THR:OG1	2:B:210:ARG:NE	2.41	0.53
1:A:399:GLU:HG3	1:A:408:LYS:HG3	1.90	0.53
2:H:137:ALA:HA	2:H:183:THR:HA	1.90	0.53
1:G:104:MET:HE1	1:G:479:TRP:CG	2.43	0.53
2:H:108:ARG:HG3	2:H:108:ARG:HH11	1.73	0.53
1:A:64:GLU:OE2	1:A:66:HIS:ND1	2.33	0.53
1:A:69:TRP:O	1:A:72:HIS:ND1	2.42	0.53
2:B:13:LYS:CE	2:B:114:PRO:HA	2.39	0.52
3:L:89:ASN:OD1	3:L:90:THR:N	2.43	0.52
1:A:111:LEU:O	1:A:115:SER:OG	2.21	0.52
1:A:342:LEU:HD11	1:A:361:PHE:CE2	2.39	0.52
2:B:61:TRP:HA	2:B:64:GLN:HG2	1.92	0.52
1:G:50:THR:HG21	1:G:223:TYR:HD2	1.75	0.52
1:G:72:HIS:CD2	1:A:369:LEU:HD11	2.44	0.52
1:G:104:MET:HE1	1:G:479:TRP:CE3	2.44	0.52
2:H:120:SER:HB3	2:H:122:PHE:HE1	1.74	0.52
1:G:62:GLU:OE1	1:G:63:THR:N	2.41	0.52
1:G:371:ILE:HD12	2:H:56:GLN:HG3	1.91	0.52
1:A:281:ALA:HB1	2:B:33:PHE:CE2	2.45	0.52
2:B:112:SER:HB2	2:B:146:PHE:HE2	1.75	0.52
2:H:47:TRP:HZ2	2:H:50:TRP:HD1	1.58	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:104:MET:O	1:A:108:VAL:HG23	2.10	0.51
1:A:248:THR:HB	1:A:486:TYR:HE2	1.75	0.51
2:B:124:LEU:HD21	2:B:141:LEU:HB2	1.92	0.51
1:A:371:ILE:HG13	2:B:56:GLN:NE2	2.22	0.51
1:A:425:ASN:HB2	2:B:54:TYR:HE1	1.75	0.51
2:B:90:TYR:O	2:B:106:GLY:HA2	2.10	0.51
2:H:4:LEU:HB2	2:H:24:VAL:HG12	1.92	0.51
2:H:112:SER:HB2	2:H:146:PHE:HZ	1.74	0.51
2:B:38:ARG:NH2	2:B:86:ASP:HA	2.26	0.51
2:H:124:LEU:HB3	3:L:118:PHE:CD2	2.45	0.51
2:H:32:GLN:OE1	2:H:98:GLY:N	2.43	0.51
2:H:34:ILE:HD12	2:H:34:ILE:O	2.10	0.50
3:L:132:LEU:HD13	3:L:178:LEU:HD11	1.92	0.50
1:A:92:ASN:O	1:A:487:LYS:NZ	2.35	0.50
1:A:95:MET:HG3	1:A:96:TRP:N	2.27	0.50
1:G:86:LEU:HD21	1:G:244:SER:HB3	1.94	0.50
2:H:99:GLU:N	2:H:99:GLU:OE1	2.42	0.50
3:L:181:THR:HG23	3:L:184:GLN:H	1.76	0.50
2:B:61:TRP:HA	2:B:64:GLN:NE2	2.25	0.50
1:G:96:TRP:HA	1:G:480:ARG:HD3	1.93	0.50
3:L:122:SER:HA	3:L:125:LEU:HG	1.93	0.50
1:G:52:LEU:HD21	1:G:219:THR:HG22	1.94	0.50
1:G:410:CYS:SG	4:G:510:NAG:O6	2.61	0.50
1:A:120:VAL:HG23	1:A:202:LYS:HG2	1.94	0.50
1:A:121:LYS:HE2	1:A:426:MET:HE1	1.94	0.50
2:B:105:GLN:HA	3:C:43:PRO:HG3	1.92	0.50
1:A:99:ASN:OD1	1:A:103:GLN:NE2	2.32	0.50
1:A:97:LYS:NZ	1:A:275:GLU:OE2	2.44	0.49
2:H:108:ARG:HG3	2:H:108:ARG:NH1	2.27	0.49
3:L:148:TRP:CE3	3:L:178:LEU:HD23	2.47	0.49
2:B:35:ASN:OD1	2:B:50:TRP:HB3	2.11	0.49
3:L:149:LYS:HD2	3:L:150:ALA:N	2.27	0.49
2:B:27:TYR:HD1	2:B:28:ASN:O	1.96	0.49
1:G:444:ASN:OD1	1:G:445:CYS:N	2.45	0.49
1:G:459:GLY:HA2	3:L:96:GLU:HG3	1.95	0.49
3:L:14:SER:OG	3:L:15:PRO:HD2	2.13	0.49
3:L:197:HIS:C	3:L:198:GLU:OE1	2.51	0.49
3:C:32:ILE:HG22	3:C:33:SER:N	2.27	0.49
3:C:47:ILE:HG22	3:C:48:ILE:HD13	1.93	0.49
2:H:90:TYR:O	2:H:106:GLY:HA2	2.12	0.49
3:L:20:THR:HG22	3:L:74:THR:HG22	1.93	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:51:ASP:OD1	3:C:66:ARG:NE	2.28	0.49
3:L:36:PHE:CE2	3:L:46:LEU:HB2	2.48	0.49
1:A:93:PHE:HB2	1:A:233:PHE:HZ	1.78	0.49
3:C:164:PRO:HA	3:C:173:ALA:O	2.13	0.49
2:H:117:LYS:N	2:H:146:PHE:O	2.44	0.48
1:A:375:SER:HG	1:A:384:TYR:HE1	1.60	0.48
1:A:439:ILE:HD12	1:A:440:ASP:O	2.13	0.48
3:C:89:ASN:OD1	3:C:90:THR:N	2.46	0.48
1:A:270:ILE:HG21	1:A:345:VAL:HG22	1.95	0.48
1:G:219:THR:OG1	1:G:223:TYR:O	2.25	0.48
1:G:363:PRO:O	1:G:469:ARG:NH1	2.46	0.48
1:G:374:HIS:NE2	1:G:376:PHE:CD2	2.82	0.48
2:H:23:GLU:OE1	2:H:23:GLU:N	2.45	0.48
3:C:86:TYR:C	3:C:87:ILE:HD12	2.33	0.48
1:G:109:ILE:HG23	1:G:428:GLN:HB3	1.95	0.48
3:L:132:LEU:HD11	3:L:185:TRP:CD1	2.48	0.48
3:L:111:ALA:O	3:L:197:HIS:NE2	2.46	0.48
3:C:42:LYS:HG3	3:C:43:PRO:HD2	1.95	0.48
3:C:118:PHE:HB2	3:C:133:VAL:HG13	1.96	0.48
1:G:369:LEU:O	1:G:370:GLU:C	2.53	0.47
2:B:212:GLU:HG3	2:B:213:PRO:HD2	1.96	0.47
3:L:80:PRO:HD2	3:L:81:GLU:H	1.79	0.47
3:L:140:TYR:HD1	3:L:141:PRO:HA	1.79	0.47
1:G:345:VAL:O	1:G:349:LEU:HG	2.14	0.47
3:L:117:LEU:HD23	3:L:119:PRO:HD3	1.96	0.47
3:C:24:SER:HB2	3:C:70:THR:HG23	1.95	0.47
3:C:138:ASP:OD1	3:C:167:GLN:NE2	2.40	0.47
1:A:485:LYS:HG3	1:A:486:TYR:CD1	2.49	0.47
2:B:67:VAL:HB	2:B:82:LEU:HD12	1.96	0.47
1:G:281:ALA:HB1	2:H:33:PHE:CE2	2.50	0.47
2:B:184:VAL:CG1	2:B:185:PRO:HD2	2.44	0.47
1:G:256:SER:OG	1:G:259:LEU:O	2.21	0.47
2:B:206:LYS:HD3	2:B:206:LYS:C	2.35	0.47
3:C:113:PRO:HD3	3:C:197:HIS:CG	2.49	0.47
2:H:148:GLU:HG3	2:H:149:PRO:HA	1.96	0.47
1:A:113:ASP:O	1:A:117:GLN:NE2	2.47	0.47
2:H:71:ARG:HG2	2:H:71:ARG:HH11	1.79	0.46
1:A:227:LYS:HE2	1:A:229:ASN:OD1	2.15	0.46
1:G:375:SER:HG	1:G:384:TYR:HE1	1.64	0.46
3:L:86:TYR:C	3:L:87:ILE:HD12	2.36	0.46
3:L:166:LYS:CG	3:L:170:ASN:HA	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:MET:HE1	1:A:484:TYR:HB2	1.97	0.46
1:A:95:MET:CE	1:A:484:TYR:HB2	2.46	0.46
1:G:460:ALA:HA	3:L:97:PHE:HE1	1.81	0.46
3:L:150:ALA:O	3:L:152:GLY:N	2.49	0.46
1:A:62:GLU:OE1	1:A:63:THR:N	2.48	0.46
1:G:349:LEU:HD12	1:G:359:ILE:HG21	1.98	0.46
3:L:50:ASP:O	3:L:52:ASP:N	2.48	0.46
1:A:300:SER:HB2	1:A:442:LYS:N	2.30	0.46
1:G:270:ILE:HG21	1:G:345:VAL:HG22	1.96	0.46
1:A:105:GLN:O	1:A:109:ILE:HG13	2.15	0.46
1:A:348:LYS:HD2	1:A:352:HIS:CE1	2.50	0.46
2:B:36:TRP:CH2	2:B:92:CYS:HB3	2.51	0.46
1:G:478:ASN:O	1:G:481:SER:OG	2.21	0.46
1:A:225:ILE:HB	1:A:245:VAL:HG12	1.97	0.46
1:A:368:ASP:CG	2:B:71:ARG:HH22	2.18	0.46
1:A:378:CYS:SG	1:A:379:ARG:HG2	2.55	0.46
3:C:3:LEU:N	3:C:99:GLY:HA2	2.31	0.46
3:C:142:GLY:HA3	3:C:172:TYR:HD2	1.81	0.46
1:G:327:ARG:HG3	1:G:327:ARG:NH1	2.30	0.46
1:A:460:ALA:H	3:C:97:PHE:HE1	1.64	0.46
1:G:265:LEU:HD21	1:G:291:SER:H	1.81	0.46
2:H:83:ARG:C	2:H:111:VAL:HG11	2.35	0.46
3:L:80:PRO:HD2	3:L:81:GLU:OE1	2.16	0.46
1:A:86:LEU:HD11	1:A:244:SER:HB3	1.96	0.46
2:B:54:TYR:HB2	2:B:56:GLN:NE2	2.23	0.46
1:G:265:LEU:HD11	1:G:291:SER:HB3	1.98	0.45
1:G:378:CYS:HB3	1:G:383:PHE:HE2	1.79	0.45
2:B:154:TRP:CH2	2:B:196:CYS:HB3	2.51	0.45
3:C:47:ILE:C	3:C:48:ILE:HD13	2.37	0.45
2:H:194:TYR:HB2	2:H:211:VAL:HB	1.97	0.45
1:A:386:ASN:O	1:A:416:LEU:HD13	2.15	0.45
2:B:36:TRP:CZ3	2:B:92:CYS:HB3	2.52	0.45
2:H:56:GLN:H	2:H:56:GLN:CD	2.20	0.45
1:A:98:ASN:ND2	1:A:486:TYR:O	2.49	0.45
1:A:121:LYS:NZ	1:A:123:THR:HG1	2.13	0.45
2:H:145:TYR:OH	2:H:178:LEU:HD23	2.17	0.45
1:A:256:SER:OG	1:A:259:LEU:O	2.31	0.45
1:G:64:GLU:OE2	1:G:66:HIS:ND1	2.38	0.45
1:G:217:TYR:O	1:G:248:THR:HG23	2.16	0.45
2:H:95:GLY:HA3	2:H:100:ASN:O	2.16	0.45
3:L:79:GLN:HB3	3:L:80:PRO:CD	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:197:HIS:O	3:C:200:SER:OG	2.28	0.45
3:L:167:GLN:HG2	3:L:169:ASN:H	1.81	0.45
1:A:84:ILE:N	1:A:84:ILE:HD12	2.32	0.45
1:A:92:ASN:C	1:A:93:PHE:HD1	2.20	0.45
1:G:399:GLU:HG3	1:G:408:LYS:HZ3	1.80	0.45
1:A:95:MET:HG3	1:A:96:TRP:CD1	2.52	0.45
2:H:138:LEU:HD13	2:H:211:VAL:HG11	1.99	0.44
3:L:4:THR:HB	3:L:24:SER:HB3	1.98	0.44
1:A:231:LYS:H	1:A:231:LYS:HG2	1.55	0.44
2:B:39:GLN:NE2	3:C:38:GLN:OE1	2.42	0.44
2:H:71:ARG:HG2	2:H:71:ARG:NH1	2.33	0.44
3:L:149:LYS:HA	3:L:154:PRO:HA	1.99	0.44
1:A:280:ASN:OD1	1:A:281:ALA:N	2.50	0.44
1:A:384:TYR:HD2	1:A:421:LYS:HD3	1.82	0.44
2:B:145:TYR:OH	2:B:178:LEU:HD23	2.17	0.44
3:C:158:GLY:O	3:C:178:LEU:HA	2.17	0.44
1:G:57:ASP:OD1	1:G:57:ASP:N	2.50	0.44
1:G:68:VAL:O	1:G:71:THR:HG22	2.17	0.44
1:G:333:ILE:HD12	1:G:333:ILE:N	2.32	0.44
2:H:34:ILE:HD11	2:H:51:MET:HB3	1.98	0.44
2:H:87:THR:HG23	2:H:111:VAL:H	1.83	0.44
1:G:248:THR:HB	1:G:486:TYR:HE2	1.82	0.44
2:H:139:GLY:HA2	2:H:154:TRP:HZ2	1.83	0.44
2:H:146:PHE:HD1	2:H:147:PRO:HA	1.77	0.44
3:L:106(A):LEU:CA	3:L:140:TYR:OH	2.63	0.44
3:L:124:GLU:OE2	3:L:131:THR:N	2.51	0.44
2:B:38:ARG:HG2	2:B:46:GLU:HB3	1.99	0.44
2:B:52:ASN:HB3	2:B:56:GLN:OE1	2.18	0.44
2:B:66:ARG:O	2:B:82(A):ARG:HG2	2.17	0.44
2:H:54:TYR:O	2:H:71:ARG:NH2	2.50	0.44
3:L:85:THR:HA	3:L:102:THR:O	2.17	0.44
1:A:272:ILE:HD11	1:A:352:HIS:NE2	2.32	0.44
1:A:384:TYR:CD2	1:A:421:LYS:HD3	2.53	0.44
2:H:15:GLY:O	2:H:82(C):LEU:HG	2.17	0.44
1:A:260:LEU:HB2	1:A:451:GLY:CA	2.48	0.44
1:G:369:LEU:C	1:G:371:ILE:N	2.71	0.44
3:L:66:ARG:HG3	3:L:71:ALA:HB2	1.99	0.44
1:A:45:TRP:CD1	1:A:489:VAL:HG21	2.53	0.44
1:G:421:LYS:HB3	1:G:421:LYS:HE3	1.49	0.44
1:A:114:GLN:O	1:A:114:GLN:NE2	2.51	0.44
1:A:275:GLU:OE1	1:A:282:LYS:NZ	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:184:GLN:O	3:C:191:TYR:OH	2.32	0.44
1:G:54:CYS:HB3	1:G:217:TYR:CE1	2.53	0.44
1:G:350:LYS:NZ	1:G:357:LYS:O	2.46	0.44
2:H:70:THR:HG22	2:H:71:ARG:H	1.83	0.44
3:L:149:LYS:NZ	3:L:151:ASP:O	2.48	0.44
1:G:104:MET:HG2	1:G:217:TYR:CE2	2.53	0.43
1:G:369:LEU:HA	1:G:372:THR:CG2	2.30	0.43
3:C:46:LEU:C	3:C:47:ILE:HD13	2.38	0.43
1:G:360:ILE:HD12	1:G:467:THR:HG22	1.99	0.43
3:L:113:PRO:HA	3:L:139:PHE:HB3	1.99	0.43
1:A:104:MET:SD	1:A:217:TYR:HE2	2.42	0.43
2:B:61:TRP:CA	2:B:64:GLN:HE21	2.30	0.43
1:G:212:PRO:HB2	1:G:252:LYS:HE2	2.01	0.43
3:L:140:TYR:CD1	3:L:141:PRO:HA	2.52	0.43
1:G:248:THR:HB	1:G:486:TYR:CE2	2.53	0.43
1:A:95:MET:HE3	1:A:273:ARG:HD3	1.99	0.43
1:A:233:PHE:CE2	1:A:235:GLY:HA2	2.53	0.43
2:B:55:GLY:O	2:B:57:VAL:HG13	2.19	0.43
2:H:36:TRP:CE2	2:H:80:MET:HB2	2.53	0.43
1:A:272:ILE:HD12	1:A:272:ILE:O	2.19	0.43
1:G:69:TRP:HA	1:G:72:HIS:HE1	1.83	0.43
2:H:11:VAL:O	2:H:12:LYS:HD2	2.19	0.43
2:H:105:GLN:CA	3:L:43:PRO:HG2	2.46	0.43
2:B:47:TRP:HZ2	2:B:50:TRP:CD1	2.35	0.43
2:B:120:SER:HB3	2:B:122:PHE:HE1	1.84	0.43
3:C:165:SER:O	3:C:172:TYR:HA	2.18	0.43
1:G:104:MET:HE2	1:G:479:TRP:CG	2.54	0.43
2:B:195:ILE:HD12	2:B:195:ILE:O	2.19	0.43
3:C:47:ILE:O	3:C:55:PRO:HD2	2.18	0.43
3:C:49:PHE:CD1	3:C:49:PHE:C	2.92	0.43
1:G:368:ASP:OD2	2:H:71:ARG:NH2	2.52	0.42
1:A:475:ILE:O	1:A:478:ASN:HB2	2.19	0.42
2:B:71:ARG:HG2	2:B:71:ARG:NH1	2.33	0.42
3:C:47:ILE:HG22	3:C:48:ILE:CD1	2.49	0.42
2:B:166:PHE:HE2	3:C:135:LEU:HG	1.85	0.42
1:G:399:GLU:HG3	1:G:408:LYS:NZ	2.34	0.42
1:G:452:ILE:HD13	1:G:452:ILE:HA	1.87	0.42
3:L:48:ILE:HA	3:L:54:ARG:HA	2.01	0.42
3:L:129:LYS:HE2	3:L:131:THR:HG23	2.01	0.42
2:H:144:ASP:HB3	2:H:175:LEU:HD12	2.02	0.42
3:C:132:LEU:HD22	3:C:178:LEU:HD22	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:227:LYS:HA	1:G:485:LYS:O	2.18	0.42
2:B:80:MET:HE2	2:B:80:MET:HB2	1.66	0.42
3:C:105:THR:HG22	3:C:106:VAL:O	2.20	0.42
1:G:328:LYS:HD2	1:G:329:ALA:H	1.85	0.42
1:G:332:GLU:C	1:G:333:ILE:HD12	2.40	0.42
1:G:348:LYS:HA	1:G:348:LYS:HD2	1.70	0.42
1:A:457:ASP:HB2	1:A:467:THR:HB	2.01	0.42
1:A:452:ILE:HD13	1:A:452:ILE:HA	1.90	0.42
1:G:231:LYS:HB3	1:G:231:LYS:HE2	1.81	0.42
1:A:381:GLU:HA	1:A:381:GLU:OE1	2.20	0.42
2:B:23:GLU:OE1	2:B:23:GLU:N	2.49	0.42
3:C:179:SER:O	3:C:180:LEU:HD23	2.20	0.42
1:A:104:MET:HB2	1:A:217:TYR:CZ	2.54	0.41
2:B:95:GLY:HA3	2:B:100:ASN:O	2.20	0.41
1:G:217:TYR:O	1:G:247:CYS:HA	2.20	0.41
4:G:505:NAG:H61	3:L:31:ILE:HG23	2.02	0.41
1:A:100:MET:HB2	1:A:483:LEU:HD13	2.01	0.41
1:A:381:GLU:OE2	1:A:438:PRO:HA	2.19	0.41
1:G:263:GLY:O	1:G:450:THR:HG21	2.20	0.41
2:H:156:SER:O	2:H:156:SER:OG	2.36	0.41
3:L:117:LEU:HD22	3:L:206:VAL:HG21	2.01	0.41
3:L:166:LYS:HA	3:L:171:LYS:O	2.20	0.41
3:C:127:ALA:O	3:C:129:LYS:HD2	2.20	0.41
2:B:40:ALA:HB3	2:B:43:GLN:HB3	2.03	0.41
2:H:113:SER:HB2	2:H:146:PHE:CD2	2.56	0.41
2:B:47:TRP:CZ2	2:B:49:GLY:HA2	2.55	0.41
2:H:105:GLN:C	3:L:43:PRO:CG	2.88	0.41
1:A:102:GLU:OE1	1:A:102:GLU:N	2.43	0.41
1:G:485:LYS:HE3	1:G:485:LYS:HB3	1.73	0.41
1:A:424:ILE:HD11	1:A:433:ALA:HB3	2.02	0.41
3:C:167:GLN:N	3:C:171:LYS:O	2.39	0.41
2:B:147:PRO:HG2	2:B:202:PRO:HG2	2.02	0.41
2:B:154:TRP:CZ3	2:B:196:CYS:HB3	2.55	0.41
3:C:129:LYS:O	3:C:182:PRO:HG3	2.21	0.41
1:G:64:GLU:O	1:G:68:VAL:HG23	2.21	0.41
1:G:257:THR:OG1	1:G:374:HIS:HA	2.20	0.41
1:G:258:GLN:HE21	1:G:470:PRO:CB	2.34	0.41
1:A:410:CYS:SG	4:A:510:NAG:O6	2.62	0.41
2:B:208:ASP:O	2:B:209:LYS:HD2	2.21	0.41
3:C:79:GLN:N	3:C:79:GLN:OE1	2.53	0.41
1:G:268:GLU:HG3	1:G:269:GLU:HG3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:284:ILE:N	1:G:284:ILE:HD12	2.36	0.41
1:A:91:GLU:HG3	1:A:93:PHE:HE1	1.86	0.41
1:A:298:ARG:HH21	1:A:326:ILE:HB	1.85	0.41
1:A:455:THR:HG23	1:A:471:GLY:HA2	2.02	0.41
1:G:452:ILE:HG22	1:G:454:LEU:HG	2.02	0.40
2:H:184:VAL:HG22	2:H:185:PRO:CD	2.52	0.40
3:L:194:ARG:HG3	3:L:203:GLU:HG2	2.03	0.40
1:A:281:ALA:HB1	2:B:33:PHE:HE2	1.84	0.40
3:C:149:LYS:HD2	3:C:150:ALA:N	2.35	0.40
3:C:182:PRO:O	3:C:186:LYS:HG2	2.21	0.40
1:G:102:GLU:O	1:G:106:GLU:HG3	2.21	0.40
1:G:104:MET:HE3	1:G:104:MET:HB3	1.83	0.40
2:H:113:SER:O	2:H:146:PHE:HE2	2.04	0.40
1:A:96:TRP:HA	1:A:480:ARG:HD3	2.02	0.40
1:G:53:PHE:CZ	1:G:218:CYS:HB2	2.55	0.40
2:B:195:ILE:CD1	2:B:197:ASN:HD21	2.34	0.40
1:G:97:LYS:NZ	1:G:275:GLU:OE2	2.53	0.40
2:H:83:ARG:O	2:H:111:VAL:HG21	2.21	0.40
1:A:257:THR:HG21	1:A:370:GLU:O	2.21	0.40
1:A:274:SER:HB2	1:A:284:ILE:HG23	2.02	0.40
2:B:14:ILE:HD12	2:B:14:ILE:O	2.22	0.40
2:B:38:ARG:HH22	2:B:86:ASP:HA	1.85	0.40
2:B:155:ASN:HD21	2:B:194:TYR:HD1	1.69	0.40
2:H:169:VAL:HG21	3:L:160:GLU:HB3	2.04	0.40
1:A:93:PHE:HB2	1:A:233:PHE:CZ	2.55	0.40
2:B:166:PHE:CD2	3:C:175:SER:HB3	2.56	0.40
2:B:172:SER:O	2:B:173:SER:OG	2.30	0.40
3:C:6:PRO:O	3:C:102:THR:OG1	2.25	0.40
3:C:166:LYS:HG2	3:C:167:GLN:O	2.22	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	342/355 (96%)	320 (94%)	20 (6%)	2 (1%)	22	50
1	G	342/355 (96%)	323 (94%)	17 (5%)	2 (1%)	22	50
2	B	209/223 (94%)	189 (90%)	19 (9%)	1 (0%)	25	54
2	H	209/223 (94%)	185 (88%)	21 (10%)	3 (1%)	9	31
3	C	197/203 (97%)	177 (90%)	14 (7%)	6 (3%)	3	19
3	L	197/203 (97%)	178 (90%)	16 (8%)	3 (2%)	8	30
All	All	1496/1562 (96%)	1372 (92%)	107 (7%)	17 (1%)	12	37

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	32	ILE
3	C	79	GLN
3	C	151	ASP
1	G	462	ASN
3	L	32	ILE
3	L	51	ASP
3	L	151	ASP
1	G	370	GLU
2	H	106	GLY
3	C	51	ASP
2	H	104	GLY
1	A	407	MET
2	B	104	GLY
2	H	32	GLN
1	A	408	LYS
3	C	108	GLN
3	C	80	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	309/313 (99%)	302 (98%)	7 (2%)	45	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	309/313 (99%)	303 (98%)	6 (2%)	52	71
2	B	181/189 (96%)	173 (96%)	8 (4%)	24	50
2	H	181/189 (96%)	175 (97%)	6 (3%)	33	58
3	C	171/174 (98%)	168 (98%)	3 (2%)	54	73
3	L	171/174 (98%)	163 (95%)	8 (5%)	22	49
All	All	1322/1352 (98%)	1284 (97%)	38 (3%)	37	61

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	46	LYS
1	G	100	MET
1	G	104	MET
1	G	244	SER
1	G	340	LYS
1	G	369	LEU
2	H	29	PHE
2	H	76	ASP
2	H	92	CYS
2	H	145	TYR
2	H	154	TRP
2	H	209	LYS
3	L	17	GLN
3	L	54	ARG
3	L	65	SER
3	L	140	TYR
3	L	149	LYS
3	L	170	ASN
3	L	179	SER
3	L	189	ARG
1	A	100	MET
1	A	205	CYS
1	A	244	SER
1	A	249	HIS
1	A	273	ARG
1	A	468	PHE
1	A	485	LYS
2	B	29	PHE
2	B	59	TYR
2	B	80	MET

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Mol	Chain	Res	Type
2	B	82(C)	LEU
2	B	83	ARG
2	B	101	HIS
2	B	112	SER
2	B	170	LEU
3	C	49	PHE
3	C	88	CYS
3	C	149	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	G	67	ASN
1	G	72	HIS
2	H	3	GLN
2	H	64	GLN
1	A	355	ASN
2	B	56	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 25 ligands modelled in this entry, 5 are monoatomic - leaving 20 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	G	503	1	14,14,15	0.22	0	17,19,21	0.41	0
4	NAG	A	502	1	14,14,15	0.17	0	17,19,21	0.40	0
4	NAG	A	506	1	14,14,15	0.25	0	17,19,21	0.47	0
4	NAG	A	510	1	14,14,15	0.20	0	17,19,21	0.50	0
4	NAG	G	504	1	14,14,15	0.21	0	17,19,21	0.52	0
4	NAG	A	508	1	14,14,15	0.23	0	17,19,21	0.57	0
4	NAG	G	506	1	14,14,15	0.23	0	17,19,21	0.43	0
4	NAG	A	504	1	14,14,15	0.20	0	17,19,21	0.49	0
4	NAG	G	502	1	14,14,15	0.20	0	17,19,21	0.37	0
4	NAG	A	509	1	14,14,15	0.21	0	17,19,21	0.48	0
4	NAG	A	505	1	14,14,15	0.24	0	17,19,21	0.36	0
4	NAG	G	501	1	14,14,15	0.21	0	17,19,21	0.44	0
4	NAG	G	508	1	14,14,15	0.69	1 (7%)	17,19,21	1.47	3 (17%)
4	NAG	G	505	1	14,14,15	0.23	0	17,19,21	0.37	0
4	NAG	A	501	1	14,14,15	0.24	0	17,19,21	0.44	0
4	NAG	G	510	1	14,14,15	0.20	0	17,19,21	0.47	0
4	NAG	A	507	1	14,14,15	0.17	0	17,19,21	0.45	0
4	NAG	G	507	1	14,14,15	0.16	0	17,19,21	0.44	0
4	NAG	G	509	1	14,14,15	0.32	0	17,19,21	0.40	0
4	NAG	A	503	1	14,14,15	0.22	0	17,19,21	0.41	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	G	503	1	-	2/6/23/26	0/1/1/1
4	NAG	A	502	1	-	3/6/23/26	0/1/1/1
4	NAG	A	506	1	-	2/6/23/26	0/1/1/1
4	NAG	A	510	1	-	2/6/23/26	0/1/1/1
4	NAG	G	504	1	-	2/6/23/26	0/1/1/1
4	NAG	A	508	1	-	2/6/23/26	0/1/1/1
4	NAG	G	506	1	-	1/6/23/26	0/1/1/1
4	NAG	A	504	1	-	2/6/23/26	0/1/1/1
4	NAG	G	502	1	-	2/6/23/26	0/1/1/1
4	NAG	A	509	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	A	505	1	-	2/6/23/26	0/1/1/1
4	NAG	G	501	1	-	2/6/23/26	0/1/1/1
4	NAG	G	508	1	-	3/6/23/26	0/1/1/1
4	NAG	G	505	1	-	1/6/23/26	0/1/1/1
4	NAG	A	501	1	-	2/6/23/26	0/1/1/1
4	NAG	G	510	1	-	2/6/23/26	0/1/1/1
4	NAG	A	507	1	-	2/6/23/26	0/1/1/1
4	NAG	G	507	1	-	2/6/23/26	0/1/1/1
4	NAG	G	509	1	-	2/6/23/26	0/1/1/1
4	NAG	A	503	1	-	2/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	508	NAG	C1-C2	-2.20	1.49	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	G	508	NAG	C1-O5-C5	3.67	117.11	112.19
4	G	508	NAG	O4-C4-C5	2.69	115.95	109.32
4	G	508	NAG	O5-C5-C6	-2.09	103.60	107.66

There are no chirality outliers.

All (40) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	G	503	NAG	O5-C5-C6-O6
4	A	505	NAG	O5-C5-C6-O6
4	A	503	NAG	O5-C5-C6-O6
4	G	508	NAG	C4-C5-C6-O6
4	G	501	NAG	O5-C5-C6-O6
4	G	502	NAG	O5-C5-C6-O6
4	G	504	NAG	O5-C5-C6-O6
4	G	510	NAG	O5-C5-C6-O6
4	G	501	NAG	C4-C5-C6-O6
4	A	505	NAG	C4-C5-C6-O6
4	A	501	NAG	O5-C5-C6-O6
4	A	504	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	A	510	NAG	O5-C5-C6-O6
4	G	503	NAG	C4-C5-C6-O6
4	A	502	NAG	O5-C5-C6-O6
4	A	506	NAG	O5-C5-C6-O6
4	A	503	NAG	C4-C5-C6-O6
4	G	502	NAG	C4-C5-C6-O6
4	G	508	NAG	O5-C5-C6-O6
4	A	504	NAG	C4-C5-C6-O6
4	A	510	NAG	C4-C5-C6-O6
4	A	502	NAG	C4-C5-C6-O6
4	G	504	NAG	C4-C5-C6-O6
4	G	510	NAG	C4-C5-C6-O6
4	A	501	NAG	C4-C5-C6-O6
4	A	506	NAG	C4-C5-C6-O6
4	A	507	NAG	C4-C5-C6-O6
4	A	507	NAG	O5-C5-C6-O6
4	G	509	NAG	O5-C5-C6-O6
4	G	509	NAG	C4-C5-C6-O6
4	G	507	NAG	C4-C5-C6-O6
4	G	506	NAG	O5-C5-C6-O6
4	G	507	NAG	O5-C5-C6-O6
4	G	505	NAG	O5-C5-C6-O6
4	A	508	NAG	C4-C5-C6-O6
4	A	508	NAG	O5-C5-C6-O6
4	A	509	NAG	C4-C5-C6-O6
4	A	509	NAG	O5-C5-C6-O6
4	A	502	NAG	C1-C2-N2-C7
4	G	508	NAG	C3-C2-N2-C7

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	510	NAG	1	0
4	G	505	NAG	1	0
4	G	510	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, 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(Å²)	Q<0.9
1	A	346/355 (97%)	-1.07	2 (0%)	85 80	94, 129, 199, 264	0
1	G	346/355 (97%)	-1.10	2 (0%)	85 80	96, 126, 185, 258	0
2	B	213/223 (95%)	-0.89	2 (0%)	81 73	100, 144, 214, 331	0
2	H	213/223 (95%)	-0.90	6 (2%)	55 47	98, 141, 223, 288	0
3	C	199/203 (98%)	-0.84	2 (1%)	79 71	131, 186, 251, 345	0
3	L	199/203 (98%)	-0.69	2 (1%)	79 71	126, 193, 275, 323	0
All	All	1516/1562 (97%)	-0.95	16 (1%)	77 70	94, 146, 235, 345	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	165	THR	4.2
2	B	165	THR	3.6
2	H	167	PRO	3.4
2	H	152	VAL	3.3
3	L	40	PRO	3.3
3	C	163	LYS	3.2
2	H	178	LEU	3.1
2	B	179	SER	2.7
3	L	207	ALA	2.6
1	A	455	THR	2.6
2	H	42	GLY	2.5
2	H	179	SER	2.5
1	G	472	GLY	2.2
1	A	366	GLY	2.2
1	G	60	ALA	2.1
3	C	81	GLU	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 ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
4	NAG	G	503	14/15	0.96	0.05	146,163,177,184	0
4	NAG	G	505	14/15	0.96	0.06	141,178,203,206	0
6	MG	A	512	1/1	0.96	0.04	83,83,83,83	0
4	NAG	G	502	14/15	0.97	0.05	127,147,161,165	0
4	NAG	G	506	14/15	0.97	0.04	119,144,160,162	0
4	NAG	G	508	14/15	0.97	0.05	138,178,192,215	0
4	NAG	A	501	14/15	0.97	0.06	182,200,213,220	0
4	NAG	A	503	14/15	0.97	0.07	156,179,192,195	0
4	NAG	A	506	14/15	0.97	0.05	136,150,163,170	0
4	NAG	A	510	14/15	0.97	0.03	137,181,191,202	0
6	MG	G	512	1/1	0.97	0.06	90,90,90,90	0
6	MG	G	513	1/1	0.97	0.08	142,142,142,142	0
4	NAG	G	501	14/15	0.97	0.05	197,210,228,230	0
4	NAG	A	505	14/15	0.98	0.06	140,178,190,203	0
4	NAG	G	510	14/15	0.98	0.03	145,177,185,186	0
4	NAG	A	507	14/15	0.98	0.04	104,145,168,171	0
4	NAG	A	508	14/15	0.98	0.04	148,164,183,196	0
4	NAG	A	509	14/15	0.98	0.05	112,130,167,176	0
4	NAG	G	507	14/15	0.98	0.04	109,140,173,175	0
4	NAG	A	502	14/15	0.98	0.04	121,139,158,159	0
4	NAG	G	509	14/15	0.98	0.06	108,125,159,187	0
4	NAG	A	504	14/15	0.98	0.06	86,108,130,138	0
4	NAG	G	504	14/15	0.99	0.04	90,106,130,135	0
5	CL	G	511	1/1	0.99	0.03	115,115,115,115	0
5	CL	A	511	1/1	0.99	0.06	154,154,154,154	0

6.5 Other polymers ⓘ

There are no such residues in this entry.