Full wwPDB X-ray Structure Validation Report (i)

Nov 12, 2024 – 09:06 PM EST

PDB ID	:	4DOH
Title	:	IL20/IL201/IL20R2 Ternary Complex
Authors	:	Logsdon, N.J.; Walter, M.R.
Deposited on	:	2012-02-09
Resolution	:	2.80 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 (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

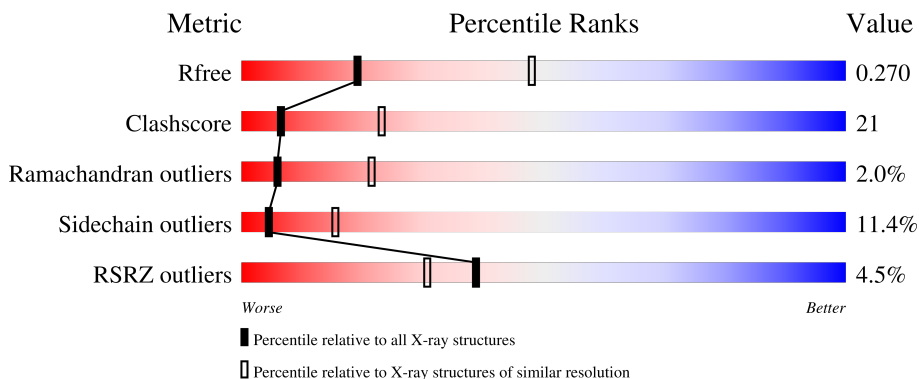|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.80 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		0.270
Clashscore		21
Ramachandran outliers		2.0%
Sidechain outliers		11.4%
RSRZ outliers		4.5%

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	3657 (2.80-2.80)
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (2.80-2.80)

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	153	71% 23% 7%
1	C	153	75% 22% •
2	B	206	68% 19% 6% 6%
2	D	206	57% 30% 7% 6%
3	E	221	50% 35% 7% 8%

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Mol	Chain	Length	Quality of chain
3	R	221	

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
4	NAG	R	302	-	-	X	-

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 8949 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 Interleukin-20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	153	Total 1231	C 772	N 224	O 226	S 9	0	0	0
1	C	153	Total 1231	C 772	N 224	O 226	S 9	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	24	ALA	-	expression tag	UNP Q9NYY1
C	24	ALA	-	expression tag	UNP Q9NYY1

- Molecule 2 is a protein called Interleukin-20 receptor subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	193	Total 1525	C 977	N 251	O 288	S 9	0	0	0
2	D	193	Total 1525	C 977	N 251	O 288	S 9	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	29	ALA	-	expression tag	UNP Q6UXL0
B	40	GLN	ASN	engineered mutation	UNP Q6UXL0
B	134	GLN	ASN	engineered mutation	UNP Q6UXL0
B	232	GLU	-	expression tag	UNP Q6UXL0
B	233	GLY	-	expression tag	UNP Q6UXL0
B	234	ARG	-	expression tag	UNP Q6UXL0
D	29	ALA	-	expression tag	UNP Q6UXL0
D	40	GLN	ASN	engineered mutation	UNP Q6UXL0
D	134	GLN	ASN	engineered mutation	UNP Q6UXL0
D	232	GLU	-	expression tag	UNP Q6UXL0

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Chain	Residue	Modelled	Actual	Comment	Reference
D	233	GLY	-	expression tag	UNP Q6UXL0
D	234	ARG	-	expression tag	UNP Q6UXL0

- Molecule 3 is a protein called Interleukin-20 receptor subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	R	204	Total 1655	C 1055	N 284	O 308	S 8	0	0	0
3	E	204	Total 1655	C 1055	N 284	O 308	S 8	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	111	ARG	LYS	engineered mutation	UNP Q9UHF4
R	113	ARG	LYS	engineered mutation	UNP Q9UHF4
R	246	ILE	-	expression tag	UNP Q9UHF4
R	247	GLU	-	expression tag	UNP Q9UHF4
R	248	GLY	-	expression tag	UNP Q9UHF4
R	249	ARG	-	expression tag	UNP Q9UHF4
E	111	ARG	LYS	engineered mutation	UNP Q9UHF4
E	113	ARG	LYS	engineered mutation	UNP Q9UHF4
E	246	ILE	-	expression tag	UNP Q9UHF4
E	247	GLU	-	expression tag	UNP Q9UHF4
E	248	GLY	-	expression tag	UNP Q9UHF4
E	249	ARG	-	expression tag	UNP Q9UHF4

- 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	B	1	Total C N O				0	0
			14 8 1 5					
4	R	1	Total C N O				0	0
			14 8 1 5					
4	R	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	E	1	Total C N O				0	0
			14 8 1 5					

- Molecule 5 is water.

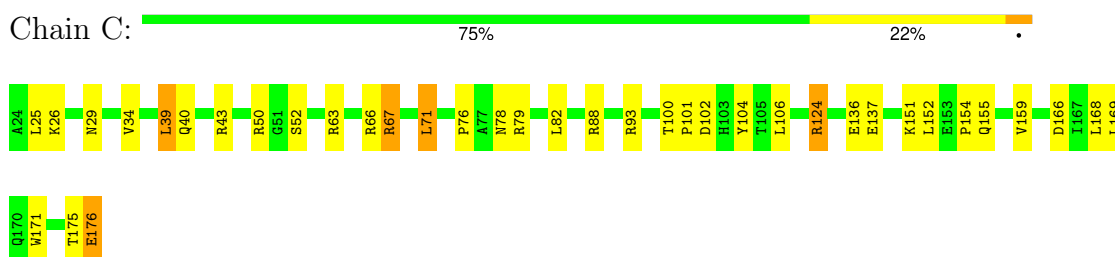| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	7	Total O		0	0
			7 7			
5	B	14	Total O		0	0
			14 14			
5	R	6	Total O		0	0
			6 6			
5	C	16	Total O		0	0
			16 16			
5	D	6	Total O		0	0
			6 6			
5	E	8	Total O		0	0
			8 8			

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.
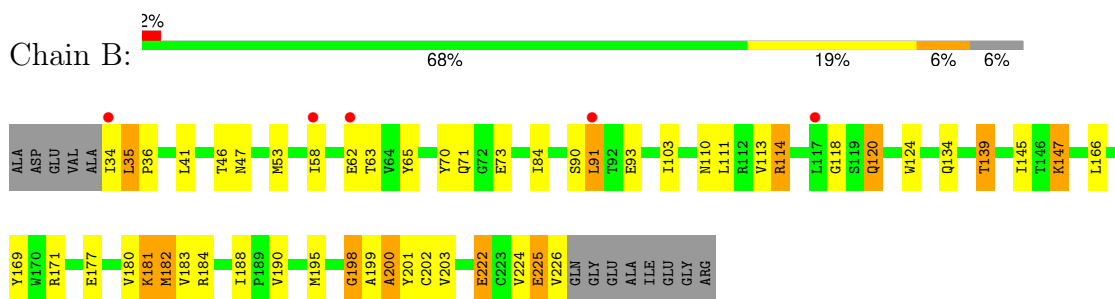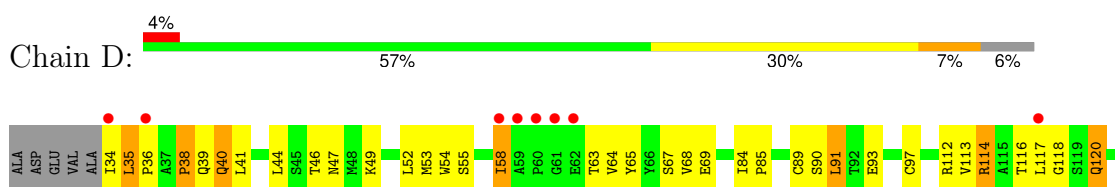
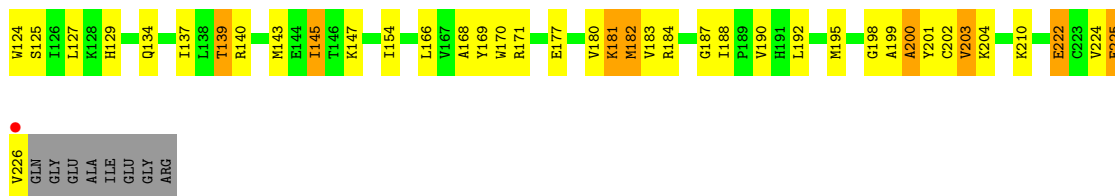• Molecule 1: Interleukin-20
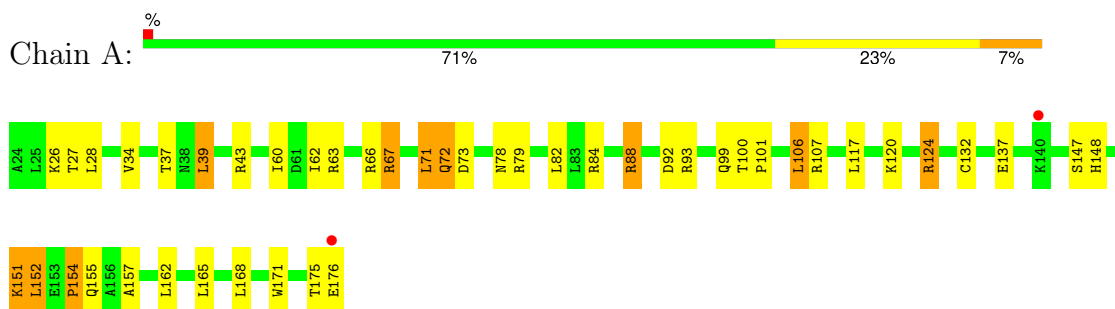
• Molecule 1: Interleukin-20

• Molecule 2: Interleukin-20 receptor subunit beta
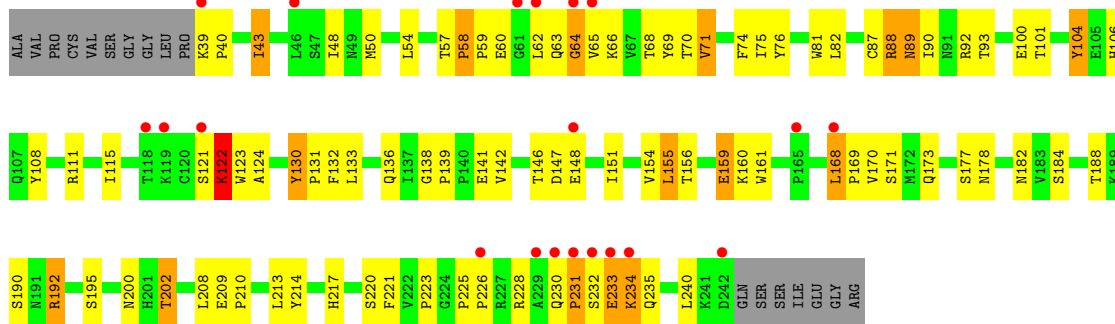

• Molecule 2: Interleukin-20 receptor subunit beta

W124 S125 I126 L127 K128 H129 Q134 I137 L138 T139 R140 M143 E144 I145 T146 K147 I154 L166 V167 A168 Y169 W170 R171 E177 V180 K181 M182 V183 R184 G187 I188 P189 V190 H191 L192 M195 G198 A199 A200 Y201 C202 V203 K204 K210 E222 C223 V224 E225

V226 GLN GLY GLU ALA ILE GLY ARG

• Molecule 3: Interleukin-20 receptor subunit alpha

Chain R:

6%

49%   35%   7%   •   8%

ALA VAL PRO CYS VAL SER GLY GLY LEU PRO K39 P40 A41 N42 I43 T44 I48 N49 M50 K51 L54 Q55 W56 T57 P58 P59 E60 G61 L62 Q63 G64 V65 K66 V67 T68 Y69 T70 V71 F74 I75 K79 K80 W81 K84 C87 R88 N89 I90 N91 R92 T93 S98 A99

E100 T101 Y104 E105 H106 Q107 Y108 V112 I115 W116 G117 T118 K119 C120 S121 K122 W123 Y130 Q136 P139 P140 E141 V142 A143 L144 T145 T146 D147 S150 I151 V154 L155 T156 E159 K160 W161 K162 R163 N164 D167 L168 P169 V170 S171 M172 Q173 N178 L179 K180

Y181 N182 V183 S184 K189 S190 N191 R192 T199 N200 H201 T202 L208 T212 L213 H217 V218 E219 V222 P223 R228 A229 Q230 P231 S232 E233 K234 Q235 C236 D242 GLN SER SER ILE GLU GLY ARG

• Molecule 3: Interleukin-20 receptor subunit alpha

Chain E:

9%

50%   35%   7%   8%

ALA VAL PRO CYS VAL SER GLY GLY LEU PRO K39 P40 I43 L46 S47 I48 N49 M50 L54 T57 P58 P59 E60 G61 L62 Q63 G64 V65 K66 V67 T68 Y69 T70 V71 F74 I75 Y76 W81 L82 C87 R88 N89 I90 N91 R92 T93 E100 T101 Y104 E105 H106

Q107 Y108 R111 I115 T118 K119 C120 S121 K122 W123 A124 Y130 P131 F132 L133 Q136 I137 G138 P139 P140 E141 V142 T146 D147 E148 I151 V154 L155 T156 E159 K160 W161 P165 L168 P169 V170 S171 M172 Q173 S177 N178 N182 V183 S184 T188 K189

S190 N191 R192 S195 N200 H201 T202 L208 E209 P210 L213 Y214 H217 S220 F221 V222 P223 G224 P225 P226 R227 R228 A229 Q230 P231 S232 E233 K234 Q235 L240 K241 D242 GLN SER SER ILE GLU GLY ARG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	103.11Å 111.76Å 136.33Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.80 50.00 – 2.81	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.80) 96.4 (50.00-2.81)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.35 (at 2.81Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.230 , 0.278 0.211 , 0.270	Depositor DCC
R_{free} test set	2006 reflections (5.16%)	wwPDB-VP
Wilson B-factor (Å^2)	56.5	Xtriage
Anisotropy	0.312	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 52.3	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	8949	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% 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 $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.50	0/1249	0.66	0/1678
1	C	0.48	0/1249	0.63	0/1678
2	B	0.45	0/1568	0.63	0/2140
2	D	0.46	0/1568	0.65	0/2140
3	E	0.48	0/1701	0.64	0/2322
3	R	0.47	0/1701	0.64	0/2322
All	All	0.47	0/9036	0.64	0/12280

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1
2	D	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	198	GLY	Peptide
2	D	187	GLY	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1231	0	1253	39	0
1	C	1231	0	1253	25	0
2	B	1525	0	1479	58	0
2	D	1525	0	1479	72	0
3	E	1655	0	1618	100	0
3	R	1655	0	1618	90	0
4	B	14	0	13	2	0
4	D	14	0	13	1	0
4	E	14	0	13	4	0
4	R	28	0	26	9	0
5	A	7	0	0	3	0
5	B	14	0	0	0	0
5	C	16	0	0	0	0
5	D	6	0	0	0	0
5	E	8	0	0	1	0
5	R	6	0	0	0	0
All	All	8949	0	8765	377	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 21.

All (377) 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:C:124:ARG:HG3	1:C:124:ARG:HH11	1.12	1.14
3:E:182:ASN:ND2	4:E:301:NAG:C1	2.14	1.10
3:E:70:THR:HG22	3:E:89:ASN:H	1.18	1.08
2:B:171:ARG:HH22	2:B:198:GLY:HA3	1.19	1.07
1:A:66:ARG:O	1:A:67:ARG:HB3	1.57	1.02
3:R:192:ARG:HG2	3:R:192:ARG:HH11	1.26	1.00
3:E:138:GLY:HA2	3:E:230:GLN:HG2	1.42	0.99
3:R:42:ASN:HD21	4:R:301:NAG:C1	1.77	0.97
3:E:192:ARG:HH11	3:E:192:ARG:HG2	1.31	0.95
1:A:124:ARG:HG3	1:A:124:ARG:HH11	1.33	0.91
2:D:147:LYS:HD3	2:D:226:VAL:HG22	1.53	0.90

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:171:ARG:NH2	2:B:198:GLY:HA3	1.88	0.86
2:D:225:GLU:CD	2:D:226:VAL:H	1.77	0.86
2:B:225:GLU:CD	2:B:226:VAL:H	1.79	0.85
3:E:148:GLU:HB3	3:E:240:LEU:HB2	1.58	0.85
3:E:104:TYR:HB3	3:E:132:PHE:HB2	1.58	0.83
3:R:63:GLN:HE21	3:R:64:GLY:H	1.25	0.83
3:R:219:GLU:HG2	3:R:232:SER:HB3	1.59	0.83
3:E:182:ASN:HD22	4:E:301:NAG:C1	1.87	0.82
1:A:124:ARG:HH11	1:A:124:ARG:CG	1.91	0.81
3:R:70:THR:HG22	3:R:88:ARG:HA	1.62	0.80
3:E:147:ASP:CG	3:E:148:GLU:H	1.84	0.80
3:E:68:THR:HG23	3:E:90:ILE:O	1.82	0.80
3:E:192:ARG:HH11	3:E:192:ARG:CG	1.95	0.80
3:E:192:ARG:HG2	3:E:192:ARG:NH1	1.92	0.79
3:E:58:PRO:HD3	3:E:93:THR:HG21	1.62	0.79
2:D:171:ARG:HH22	2:D:198:GLY:HA3	1.46	0.79
1:C:124:ARG:HG3	1:C:124:ARG:NH1	1.84	0.79
3:E:178:ASN:HD22	3:E:223:PRO:HG2	1.47	0.79
2:D:46:THR:HG22	2:D:137:ILE:HB	1.65	0.78
2:D:64:VAL:HG22	2:D:117:LEU:HG	1.66	0.78
3:E:70:THR:CG2	3:E:89:ASN:H	1.97	0.78
3:E:234:LYS:H	3:E:234:LYS:HD2	1.49	0.77
3:R:182:ASN:ND2	4:R:302:NAG:C1	2.49	0.76
1:A:124:ARG:HG3	1:A:124:ARG:NH1	1.95	0.76
1:C:124:ARG:HH11	1:C:124:ARG:CG	1.94	0.76
3:R:42:ASN:ND2	4:R:301:NAG:C1	2.48	0.75
3:E:39:LYS:HA	3:E:122:LYS:NZ	2.01	0.75
3:R:233:GLU:OE1	3:R:233:GLU:HA	1.85	0.75
3:E:43:ILE:HD12	3:E:43:ILE:H	1.52	0.74
1:C:78:ASN:ND2	1:C:137:GLU:HB3	2.02	0.74
2:D:171:ARG:HG3	2:D:199:ALA:HB3	1.70	0.73
4:B:301:NAG:H2	4:R:302:NAG:O4	1.89	0.73
3:R:143:ALA:HB3	3:R:154:VAL:HG23	1.69	0.72
3:E:182:ASN:HD21	4:E:301:NAG:C1	2.01	0.72
3:R:233:GLU:CD	3:R:234:LYS:H	1.93	0.72
2:D:145:ILE:HD12	2:D:145:ILE:H	1.53	0.72
2:D:40:GLN:O	2:D:54:TRP:HA	1.89	0.72
3:E:70:THR:HG22	3:E:89:ASN:N	2.02	0.71
3:E:159:GLU:OE2	3:E:169:PRO:HB3	1.88	0.71
3:E:178:ASN:ND2	3:E:223:PRO:HG2	2.04	0.71
2:D:199:ALA:O	2:D:200:ALA:CB	2.39	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:145:ILE:HG12	2:B:203:VAL:HG21	1.73	0.70
3:R:192:ARG:HG2	3:R:192:ARG:NH1	1.94	0.70
3:R:70:THR:CG2	3:R:89:ASN:H	2.04	0.70
3:E:68:THR:HB	3:E:115:ILE:HD11	1.71	0.70
3:R:39:LYS:N	3:R:40:PRO:HD3	2.06	0.70
3:R:182:ASN:HD21	4:R:302:NAG:C1	2.05	0.70
3:E:154:VAL:HG12	3:E:202:THR:HB	1.74	0.69
2:B:41:LEU:HD21	2:B:113:VAL:HG12	1.74	0.69
3:R:63:GLN:NE2	3:R:64:GLY:H	1.90	0.69
2:D:199:ALA:O	2:D:200:ALA:HB3	1.92	0.69
2:B:195:MET:HE1	2:B:224:VAL:HG23	1.75	0.68
2:B:188:ILE:CD1	4:R:302:NAG:H3	2.24	0.68
3:E:39:LYS:N	3:E:40:PRO:HD3	2.09	0.68
3:E:63:GLN:HG2	3:E:64:GLY:H	1.59	0.68
1:A:78:ASN:ND2	1:A:137:GLU:HB3	2.07	0.68
3:R:58:PRO:HD3	3:R:93:THR:HG21	1.76	0.67
3:R:74:PHE:HB2	3:R:81:TRP:CE3	2.29	0.67
3:E:233:GLU:HA	3:E:233:GLU:OE1	1.94	0.67
3:E:139:PRO:HG3	3:E:231:PRO:O	1.93	0.67
1:C:66:ARG:O	1:C:67:ARG:HB3	1.95	0.67
2:D:188:ILE:HD13	4:E:301:NAG:H3	1.77	0.67
2:B:200:ALA:HA	2:B:225:GLU:HG2	1.77	0.67
3:R:190:SER:HB2	3:R:192:ARG:HG3	1.77	0.66
3:R:192:ARG:HH11	3:R:192:ARG:CG	2.05	0.66
2:B:188:ILE:HD11	4:R:302:NAG:H3	1.78	0.66
2:D:84:ILE:HG23	2:D:85:PRO:HD2	1.77	0.65
1:A:28:LEU:HD12	1:A:37:THR:HG21	1.79	0.65
2:D:34:ILE:HD12	2:D:35:LEU:N	2.12	0.65
2:D:34:ILE:HG13	2:D:120:GLN:HE21	1.61	0.65
3:R:71:VAL:HG13	3:R:87:CYS:HB3	1.79	0.65
1:C:66:ARG:O	1:C:67:ARG:CB	2.45	0.64
3:R:233:GLU:OE2	3:R:234:LYS:HD2	1.96	0.64
2:D:195:MET:HE1	2:D:224:VAL:HG23	1.79	0.64
1:A:100:THR:CG2	1:A:106:LEU:HD13	2.28	0.64
3:R:74:PHE:HB2	3:R:81:TRP:CZ3	2.33	0.64
2:D:143:MET:HE1	2:D:203:VAL:HG23	1.79	0.63
2:D:145:ILE:HD12	2:D:145:ILE:N	2.12	0.63
1:A:78:ASN:HD22	1:A:137:GLU:HB3	1.62	0.63
4:B:301:NAG:C2	4:R:302:NAG:O4	2.46	0.63
3:E:43:ILE:HG22	3:E:54:LEU:HD11	1.80	0.63
3:R:43:ILE:HD12	3:R:43:ILE:H	1.65	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:R:49:ASN:O	3:R:50:MET:HB2	2.00	0.62
3:R:155:LEU:HD12	3:R:201:HIS:O	2.01	0.61
3:R:70:THR:HG22	3:R:89:ASN:H	1.64	0.61
3:E:101:THR:HG22	3:E:108:TYR:CG	2.36	0.61
3:E:147:ASP:CG	3:E:148:GLU:N	2.48	0.61
2:D:41:LEU:HA	2:D:53:MET:O	2.01	0.61
3:E:39:LYS:HA	3:E:122:LYS:HZ2	1.65	0.60
3:R:180:LYS:HG2	3:R:199:THR:HG22	1.83	0.60
3:R:168:LEU:HD12	3:R:168:LEU:H	1.67	0.60
1:C:76:PRO:HA	1:C:79:ARG:HG3	1.81	0.60
1:A:28:LEU:HD12	1:A:37:THR:CG2	2.32	0.59
3:R:159:GLU:OE2	3:R:169:PRO:HB3	2.02	0.59
2:B:199:ALA:O	2:B:200:ALA:HB3	2.01	0.59
2:B:169:TYR:HB3	2:B:203:VAL:HG12	1.84	0.59
2:B:200:ALA:CA	2:B:225:GLU:HG2	2.33	0.59
3:E:111:ARG:HA	3:E:124:ALA:O	2.02	0.58
2:B:145:ILE:HD12	2:B:145:ILE:N	2.18	0.58
3:E:62:LEU:HB2	3:E:63:GLN:OE1	2.03	0.58
1:A:43:ARG:HD2	5:A:202:HOH:O	2.02	0.58
3:R:173:GLN:HG3	3:R:179:LEU:HB3	1.85	0.58
3:E:63:GLN:H	3:E:63:GLN:NE2	2.02	0.58
1:A:99:GLN:HG2	1:A:155:GLN:OE1	2.03	0.58
2:D:34:ILE:HG13	2:D:120:GLN:NE2	2.17	0.58
3:E:136:GLN:HE21	3:E:228:ARG:HD3	1.69	0.57
3:R:178:ASN:HD22	3:R:223:PRO:HG2	1.68	0.57
3:R:136:GLN:HE21	3:R:228:ARG:HD3	1.68	0.57
2:D:39:GLN:OE1	2:D:39:GLN:HA	2.05	0.57
2:B:34:ILE:HD12	2:B:35:LEU:N	2.19	0.57
1:C:26:LYS:NZ	1:C:176:GLU:O	2.27	0.56
2:D:35:LEU:HD23	2:D:36:PRO:HD2	1.87	0.56
2:D:90:SER:O	2:D:91:LEU:HB2	2.06	0.56
2:D:195:MET:HB3	2:D:201:TYR:CE2	2.41	0.56
4:D:301:NAG:O4	4:D:301:NAG:C1	2.53	0.56
2:D:166:LEU:CD2	2:D:182:MET:HG2	2.36	0.56
3:E:148:GLU:CB	3:E:240:LEU:HB2	2.31	0.56
2:B:47:ASN:HD21	2:B:139:THR:HB	1.70	0.56
2:D:171:ARG:CG	2:D:199:ALA:HB3	2.36	0.55
2:D:35:LEU:HD11	2:D:117:LEU:HB2	1.88	0.55
2:B:166:LEU:HD23	2:B:182:MET:HG2	1.88	0.55
2:B:103:ILE:HD12	2:B:103:ILE:N	2.21	0.55
2:D:181:LYS:HG3	2:D:182:MET:N	2.21	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:145:ILE:HG12	2:B:203:VAL:CG2	2.37	0.55
3:E:63:GLN:HG2	3:E:64:GLY:N	2.21	0.54
3:R:68:THR:HG22	3:R:90:ILE:N	2.21	0.54
2:D:112:ARG:HG3	2:D:124:TRP:CE3	2.42	0.54
3:E:74:PHE:CD2	3:E:75:ILE:N	2.75	0.54
3:E:168:LEU:HD12	3:E:168:LEU:H	1.72	0.54
2:D:200:ALA:CA	2:D:225:GLU:HG2	2.37	0.54
3:E:190:SER:OG	3:E:192:ARG:HG3	2.08	0.54
2:B:84:ILE:HD12	2:B:84:ILE:N	2.22	0.54
3:R:222:VAL:HG23	3:R:222:VAL:O	2.07	0.54
2:D:225:GLU:CD	2:D:226:VAL:N	2.55	0.54
3:E:141:GLU:O	3:E:155:LEU:HA	2.08	0.54
3:E:136:GLN:HG2	3:E:228:ARG:HB2	1.89	0.54
3:R:63:GLN:HG2	3:R:64:GLY:N	2.23	0.53
2:D:69:GLU:OE1	2:D:112:ARG:NH2	2.39	0.53
3:E:68:THR:HG22	3:E:69:TYR:N	2.23	0.53
3:R:168:LEU:HD12	3:R:168:LEU:N	2.23	0.53
3:R:164:ASN:O	3:R:167:ASP:HB2	2.09	0.53
3:E:104:TYR:CB	3:E:132:PHE:HB2	2.35	0.53
1:A:71:LEU:HD13	1:A:175:THR:HG21	1.92	0.52
2:B:35:LEU:CD2	2:B:36:PRO:HD2	2.39	0.52
3:E:68:THR:HG21	3:E:89:ASN:OD1	2.09	0.52
2:B:91:LEU:N	2:B:91:LEU:HD22	2.25	0.52
2:D:65:TYR:CE1	2:D:93:GLU:HG2	2.44	0.52
2:D:183:VAL:HG13	2:D:190:VAL:HG21	1.90	0.52
2:D:195:MET:HE1	2:D:224:VAL:CG2	2.39	0.52
3:R:160:LYS:HG2	3:R:161:TRP:N	2.23	0.51
2:D:67:SER:OG	2:D:91:LEU:HD22	2.10	0.51
3:E:160:LYS:HG2	3:E:161:TRP:N	2.24	0.51
2:B:199:ALA:O	2:B:200:ALA:CB	2.58	0.51
2:D:34:ILE:HD12	2:D:35:LEU:H	1.75	0.51
2:D:169:TYR:HA	2:D:202:CYS:O	2.10	0.51
3:R:151:ILE:HG13	3:R:208:LEU:CD1	2.41	0.51
1:C:155:GLN:O	1:C:159:VAL:HG23	2.11	0.51
3:R:68:THR:HB	3:R:115:ILE:CG1	2.41	0.51
3:R:70:THR:HG23	3:R:89:ASN:H	1.73	0.51
1:A:84:ARG:HH11	1:A:120:LYS:HZ3	1.57	0.51
2:D:34:ILE:HD11	2:D:120:GLN:HG3	1.93	0.51
3:R:168:LEU:H	3:R:168:LEU:CD1	2.22	0.50
2:D:201:TYR:N	2:D:201:TYR:CD2	2.79	0.50
1:A:124:ARG:HH11	1:A:124:ARG:CB	2.24	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:34:ILE:HD11	2:B:120:GLN:HG3	1.92	0.50
2:B:114:ARG:HG2	2:B:124:TRP:CZ3	2.47	0.50
2:D:84:ILE:CG2	2:D:85:PRO:HD2	2.42	0.50
2:D:200:ALA:HA	2:D:225:GLU:HG2	1.92	0.50
3:R:234:LYS:HD2	3:R:234:LYS:O	2.12	0.50
2:B:145:ILE:HD12	2:B:145:ILE:H	1.76	0.50
2:B:147:LYS:HE2	2:B:225:GLU:O	2.11	0.50
3:E:68:THR:HB	3:E:115:ILE:CD1	2.40	0.50
2:B:195:MET:HB3	2:B:201:TYR:CE2	2.48	0.49
3:R:48:ILE:HG13	3:R:48:ILE:O	2.13	0.49
1:A:154:PRO:O	1:A:157:ALA:N	2.44	0.49
2:B:65:TYR:CE1	2:B:93:GLU:HG2	2.47	0.49
2:B:70:TYR:HB3	2:B:111:LEU:HD23	1.93	0.49
5:A:201:HOH:O	3:R:106:HIS:HD2	1.95	0.49
3:E:115:ILE:C	3:E:115:ILE:HD12	2.33	0.49
1:A:62:ILE:HD12	1:A:151:LYS:HE3	1.93	0.49
3:R:118:THR:HG22	3:R:118:THR:O	2.11	0.49
3:E:66:LYS:HG2	3:E:66:LYS:O	2.11	0.49
3:R:63:GLN:HG2	3:R:64:GLY:H	1.76	0.49
1:C:67:ARG:NH1	3:E:106:HIS:CE1	2.81	0.49
2:D:38:PRO:HB3	2:D:54:TRP:CD1	2.48	0.49
2:D:91:LEU:HD11	2:D:116:THR:HG21	1.95	0.49
1:A:100:THR:HG23	1:A:106:LEU:HD13	1.95	0.48
3:R:160:LYS:HB3	3:R:170:VAL:HB	1.94	0.48
1:C:40:GLN:NE2	3:E:226:PRO:HD3	2.28	0.48
2:B:103:ILE:O	2:B:103:ILE:HG22	2.12	0.48
3:E:69:TYR:CE2	3:E:93:THR:HG22	2.49	0.48
3:R:63:GLN:CG	3:R:64:GLY:H	2.25	0.48
1:A:100:THR:OG1	1:A:101:PRO:HD2	2.13	0.48
2:B:188:ILE:HD13	4:R:302:NAG:H3	1.94	0.48
3:R:155:LEU:HD12	3:R:155:LEU:H	1.78	0.48
2:D:39:GLN:O	2:D:55:SER:N	2.42	0.48
1:C:40:GLN:HE22	3:E:226:PRO:HD3	1.77	0.48
2:D:34:ILE:CG1	2:D:120:GLN:HE21	2.26	0.48
2:D:171:ARG:NH1	2:D:199:ALA:H	2.12	0.48
3:E:108:TYR:CD2	3:E:108:TYR:N	2.81	0.48
2:B:41:LEU:HD12	2:B:41:LEU:H	1.78	0.48
2:B:183:VAL:HG13	2:B:190:VAL:HG21	1.96	0.48
3:R:39:LYS:N	3:R:40:PRO:CD	2.75	0.48
3:E:230:GLN:O	3:E:231:PRO:C	2.52	0.48
2:B:70:TYR:CB	2:B:111:LEU:HD23	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:R:217:HIS:HB3	3:R:234:LYS:HA	1.96	0.47
2:D:147:LYS:HE2	2:D:225:GLU:O	2.14	0.47
2:D:41:LEU:HD21	2:D:113:VAL:HG12	1.96	0.47
3:E:63:GLN:CG	3:E:64:GLY:H	2.25	0.47
3:R:178:ASN:ND2	3:R:223:PRO:HG2	2.29	0.47
2:B:35:LEU:HD22	2:B:36:PRO:HD2	1.95	0.47
3:R:43:ILE:CG2	3:R:54:LEU:HD11	2.45	0.47
2:D:64:VAL:HA	2:D:117:LEU:HD23	1.96	0.47
3:E:90:ILE:HD13	3:E:92:ARG:NH2	2.29	0.47
2:B:225:GLU:CD	2:B:226:VAL:N	2.60	0.47
2:D:114:ARG:HG2	2:D:124:TRP:CH2	2.49	0.47
3:E:39:LYS:HA	3:E:122:LYS:HZ3	1.76	0.47
3:R:63:GLN:O	3:R:65:VAL:N	2.48	0.47
3:R:139:PRO:HD3	3:R:230:GLN:HG2	1.97	0.47
1:A:63:ARG:O	1:A:66:ARG:HG3	2.14	0.47
2:B:145:ILE:HD13	2:B:222:GLU:OE1	2.14	0.47
2:B:195:MET:HE3	2:B:201:TYR:HB2	1.95	0.47
3:E:63:GLN:CD	3:E:63:GLN:N	2.67	0.47
3:E:115:ILE:HD12	3:E:115:ILE:O	2.15	0.47
3:E:168:LEU:HD12	3:E:168:LEU:N	2.30	0.47
1:A:34:VAL:HG11	1:C:34:VAL:HG11	1.97	0.47
2:D:192:LEU:HD23	2:D:192:LEU:HA	1.59	0.47
1:C:71:LEU:HD13	1:C:175:THR:HG21	1.97	0.47
2:D:68:VAL:HB	2:D:89:CYS:HB2	1.97	0.47
2:D:170:TRP:CE2	2:D:202:CYS:HB2	2.50	0.47
2:B:166:LEU:CD2	2:B:182:MET:HG2	2.45	0.47
2:B:195:MET:HE1	2:B:224:VAL:CG2	2.43	0.47
3:R:40:PRO:HG2	3:R:112:VAL:HG13	1.97	0.47
3:E:146:THR:HG22	3:E:151:ILE:HG12	1.97	0.46
3:E:160:LYS:HE3	3:E:161:TRP:O	2.15	0.46
3:E:68:THR:HG21	3:E:89:ASN:CG	2.35	0.46
1:A:117:LEU:HD21	2:B:73:GLU:HG2	1.96	0.46
1:A:124:ARG:HH11	1:A:124:ARG:HB2	1.81	0.46
3:E:39:LYS:N	3:E:40:PRO:CD	2.79	0.46
3:E:43:ILE:CG2	3:E:54:LEU:HD11	2.45	0.46
3:E:63:GLN:H	3:E:63:GLN:CD	2.19	0.46
3:R:130:TYR:CD1	3:R:130:TYR:C	2.88	0.46
3:E:100:GLU:H	3:E:100:GLU:CD	2.19	0.46
3:R:63:GLN:CG	3:R:64:GLY:N	2.79	0.46
2:D:166:LEU:HD23	2:D:182:MET:HG2	1.98	0.46
1:A:66:ARG:HD3	1:A:148:HIS:CE1	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:91:LEU:CD1	2:D:116:THR:HG21	2.46	0.46
3:R:43:ILE:O	3:R:44:THR:HG23	2.16	0.46
1:C:78:ASN:HD22	1:C:137:GLU:HB3	1.77	0.46
1:A:171:TRP:O	1:A:175:THR:HG23	2.16	0.46
3:R:68:THR:HG21	3:R:89:ASN:OD1	2.16	0.46
3:R:90:ILE:HG21	3:R:92:ARG:HH22	1.80	0.46
2:B:34:ILE:HG13	2:B:120:GLN:NE2	2.31	0.46
3:R:84:LYS:HE2	3:R:100:GLU:CD	2.36	0.46
3:R:130:TYR:C	3:R:130:TYR:HD1	2.19	0.45
3:E:104:TYR:CD1	3:E:104:TYR:N	2.85	0.45
3:R:233:GLU:CD	3:R:234:LYS:N	2.65	0.45
1:A:39:LEU:HD12	1:A:39:LEU:HA	1.71	0.45
3:E:233:GLU:OE1	3:E:234:LYS:HD2	2.16	0.45
2:B:41:LEU:HA	2:B:53:MET:O	2.16	0.45
3:R:51:LYS:HA	3:R:98:SER:OG	2.17	0.45
3:R:56:TRP:CE2	3:R:93:THR:HA	2.52	0.45
2:D:40:GLN:HB2	2:D:55:SER:OG	2.16	0.45
3:R:136:GLN:NE2	3:R:228:ARG:HD3	2.32	0.45
2:D:67:SER:O	2:D:113:VAL:HA	2.16	0.45
2:D:145:ILE:HD13	2:D:222:GLU:HG2	1.99	0.45
2:B:134:GLN:NE2	2:D:134:GLN:NE2	2.65	0.45
1:A:124:ARG:HD2	5:A:205:HOH:O	2.16	0.45
3:R:58:PRO:HA	3:R:59:PRO:HD3	1.82	0.45
2:D:34:ILE:CD1	2:D:120:GLN:HE21	2.30	0.45
2:D:47:ASN:HD21	2:D:139:THR:HB	1.81	0.45
3:R:189:LYS:HB2	3:R:212:THR:HG23	1.98	0.44
3:R:101:THR:HA	3:R:108:TYR:CZ	2.52	0.44
3:R:48:ILE:HD12	3:R:49:ASN:CG	2.37	0.44
1:A:72:GLN:HG3	1:A:73:ASP:N	2.32	0.44
3:E:217:HIS:HA	3:E:233:GLU:O	2.17	0.44
1:A:88:ARG:HD3	1:A:92:ASP:OD2	2.18	0.44
2:B:71:GLN:HE21	2:B:110:ASN:HD22	1.65	0.44
1:A:84:ARG:HH11	1:A:120:LYS:NZ	2.16	0.44
2:D:65:TYR:HE1	2:D:93:GLU:HG2	1.82	0.44
2:B:34:ILE:CD1	2:B:120:GLN:HE21	2.31	0.44
1:C:63:ARG:HG3	3:E:76:TYR:CE2	2.53	0.44
2:B:71:GLN:HG2	2:B:110:ASN:HB2	1.99	0.44
3:E:74:PHE:HB2	3:E:81:TRP:CZ3	2.52	0.44
1:C:100:THR:OG1	1:C:101:PRO:HD2	2.18	0.43
1:C:171:TRP:O	1:C:175:THR:HG23	2.18	0.43
3:E:88:ARG:HB2	3:E:88:ARG:HH11	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:R:63:GLN:HE21	3:R:64:GLY:N	2.04	0.43
2:D:143:MET:CE	2:D:203:VAL:HG23	2.46	0.43
2:B:103:ILE:N	2:B:103:ILE:CD1	2.81	0.43
2:B:200:ALA:N	2:B:225:GLU:HG2	2.33	0.43
3:E:50:MET:HE1	3:E:131:PRO:HB2	2.00	0.43
3:E:225:PRO:HA	3:E:226:PRO:HD2	1.93	0.43
3:R:171:SER:C	3:R:173:GLN:N	2.72	0.43
3:E:63:GLN:O	3:E:65:VAL:N	2.52	0.43
3:E:71:VAL:HG13	3:E:87:CYS:HB3	2.01	0.43
3:E:141:GLU:HG2	3:E:156:THR:OG1	2.19	0.43
1:A:100:THR:HG22	1:A:106:LEU:HD13	2.00	0.43
1:C:25:LEU:HG	2:D:210:LYS:HD2	2.00	0.43
3:E:133:LEU:HD22	3:E:225:PRO:HG3	2.01	0.43
1:A:120:LYS:HZ2	1:A:124:ARG:NH1	2.17	0.43
1:A:71:LEU:HD22	1:A:79:ARG:HG2	2.01	0.43
2:B:225:GLU:OE1	2:B:226:VAL:HG23	2.18	0.43
2:D:64:VAL:HA	2:D:117:LEU:CD2	2.49	0.43
3:E:208:LEU:HD22	3:E:214:TYR:CZ	2.54	0.43
1:A:165:LEU:HD23	1:A:165:LEU:HA	1.74	0.42
1:A:151:LYS:HB2	1:A:151:LYS:HE2	1.75	0.42
2:B:134:GLN:HG3	2:B:134:GLN:O	2.19	0.42
3:E:121:SER:O	3:E:122:LYS:O	2.36	0.42
3:E:130:TYR:HA	3:E:131:PRO:HD2	1.90	0.42
3:R:74:PHE:CD2	3:R:75:ILE:N	2.87	0.42
3:E:39:LYS:N	3:E:121:SER:HB2	2.34	0.42
3:R:142:VAL:CG2	3:R:235:GLN:HB2	2.50	0.42
1:A:26:LYS:HG2	1:A:39:LEU:HD22	2.01	0.42
1:C:43:ARG:HG2	1:C:169:LEU:HD13	2.02	0.42
3:E:101:THR:HA	3:E:108:TYR:CZ	2.54	0.42
2:B:201:TYR:CD2	2:B:201:TYR:N	2.87	0.42
1:C:71:LEU:HD23	1:C:71:LEU:HA	1.82	0.42
2:D:58:ILE:H	2:D:58:ILE:HG12	1.67	0.42
3:E:50:MET:CE	3:E:131:PRO:HB2	2.49	0.42
2:B:134:GLN:NE2	2:D:134:GLN:HE21	2.18	0.42
3:E:60:GLU:OE2	3:E:60:GLU:HA	2.20	0.42
3:R:64:GLY:O	3:R:66:LYS:N	2.52	0.42
3:E:68:THR:HG23	3:E:90:ILE:C	2.40	0.42
3:R:63:GLN:O	3:R:64:GLY:C	2.58	0.42
3:R:167:ASP:O	3:R:169:PRO:HD3	2.20	0.42
2:B:90:SER:O	2:B:91:LEU:HB2	2.20	0.41
3:R:41:ALA:O	3:R:42:ASN:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:84:ARG:NH1	1:A:120:LYS:NZ	2.67	0.41
1:A:152:LEU:N	1:A:152:LEU:CD1	2.82	0.41
1:A:162:LEU:HD12	1:A:162:LEU:HA	1.86	0.41
3:E:171:SER:C	3:E:173:GLN:H	2.23	0.41
3:E:177:SER:HA	5:E:402:HOH:O	2.19	0.41
1:C:166:ASP:OD1	1:C:166:ASP:N	2.54	0.41
1:A:107:ARG:HG2	2:B:84:ILE:HG21	2.03	0.41
3:R:122:LYS:HB2	3:R:123:TRP:H	1.57	0.41
3:R:190:SER:CB	3:R:192:ARG:HG3	2.48	0.41
3:E:63:GLN:CG	3:E:64:GLY:N	2.83	0.41
3:E:141:GLU:CG	3:E:156:THR:OG1	2.69	0.41
2:D:168:ALA:HB3	2:D:204:LYS:HG3	2.02	0.41
3:E:68:THR:CG2	3:E:90:ILE:N	2.84	0.41
3:E:81:TRP:O	3:E:82:LEU:HD23	2.20	0.41
3:R:141:GLU:HG3	3:R:156:THR:OG1	2.20	0.41
2:B:169:TYR:HA	2:B:202:CYS:O	2.21	0.41
3:R:59:PRO:HB2	3:R:60:GLU:H	1.69	0.41
3:E:57:THR:HA	3:E:58:PRO:HD2	1.84	0.41
3:E:209:GLU:HA	3:E:210:PRO:HD3	1.84	0.41
3:R:70:THR:HG22	3:R:89:ASN:N	2.34	0.41
3:E:122:LYS:HB2	3:E:123:TRP:H	1.67	0.41
3:R:213:LEU:HD11	3:R:236:CYS:HB3	2.02	0.40
3:R:147:ASP:HB3	3:R:150:SER:O	2.21	0.40
2:D:127:LEU:HD21	2:D:129:HIS:O	2.21	0.40
3:E:136:GLN:NE2	3:E:228:ARG:HD3	2.34	0.40
3:E:188:THR:OG1	3:E:213:LEU:HB3	2.21	0.40
2:B:181:LYS:HB2	2:B:181:LYS:HE2	1.86	0.40
3:R:63:GLN:C	3:R:65:VAL:N	2.73	0.40
1:C:39:LEU:HD12	1:C:39:LEU:HA	1.75	0.40
2:B:35:LEU:HD23	2:B:36:PRO:HD2	2.03	0.40
3:R:79:LYS:HB2	3:R:79:LYS:HE3	1.84	0.40
3:R:104:TYR:CD1	3:R:104:TYR:N	2.87	0.40
1:C:102:ASP:OD1	1:C:104:TYR:HB3	2.21	0.40
1:C:136:GLU:HG3	1:C:137:GLU:N	2.37	0.40
2:D:143:MET:HG3	2:D:154:ILE:HD11	2.03	0.40
2:D:168:ALA:O	2:D:203:VAL:HA	2.22	0.40
2:D:225:GLU:OE1	2:D:226:VAL:N	2.55	0.40
3:E:60:GLU:O	3:E:60:GLU:HG3	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	151/153 (99%)	141 (93%)	8 (5%)	2 (1%)	10	32
1	C	151/153 (99%)	142 (94%)	7 (5%)	2 (1%)	10	32
2	B	191/206 (93%)	174 (91%)	14 (7%)	3 (2%)	8	27
2	D	191/206 (93%)	173 (91%)	13 (7%)	5 (3%)	4	16
3	E	202/221 (91%)	178 (88%)	18 (9%)	6 (3%)	3	13
3	R	202/221 (91%)	184 (91%)	14 (7%)	4 (2%)	6	21
All	All	1088/1160 (94%)	992 (91%)	74 (7%)	22 (2%)	6	21

All (22) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	R	59	PRO
3	R	122	LYS
1	C	67	ARG
3	E	59	PRO
3	E	122	LYS
1	A	67	ARG
1	A	154	PRO
2	B	118	GLY
3	R	64	GLY
2	D	118	GLY
2	D	200	ALA
3	E	64	GLY
1	C	154	PRO
2	D	91	LEU
3	E	89	ASN
2	B	62	GLU
2	B	200	ALA
3	R	89	ASN
2	D	40	GLN
3	E	231	PRO

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Mol	Chain	Res	Type
2	D	38	PRO
3	E	58	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	137/137 (100%)	121 (88%)	16 (12%)	4	14
1	C	137/137 (100%)	123 (90%)	14 (10%)	6	19
2	B	168/177 (95%)	152 (90%)	16 (10%)	7	22
2	D	168/177 (95%)	147 (88%)	21 (12%)	3	12
3	E	186/201 (92%)	163 (88%)	23 (12%)	4	13
3	R	186/201 (92%)	164 (88%)	22 (12%)	4	14
All	All	982/1030 (95%)	870 (89%)	112 (11%)	4	15

All (112) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	THR
1	A	39	LEU
1	A	60	ILE
1	A	71	LEU
1	A	72	GLN
1	A	82	LEU
1	A	88	ARG
1	A	93	ARG
1	A	106	LEU
1	A	124	ARG
1	A	132	CYS
1	A	147	SER
1	A	151	LYS
1	A	152	LEU
1	A	168	LEU
1	A	176	GLU

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Mol	Chain	Res	Type
2	B	35	LEU
2	B	46	THR
2	B	58	ILE
2	B	63	THR
2	B	91	LEU
2	B	114	ARG
2	B	120	GLN
2	B	139	THR
2	B	147	LYS
2	B	177	GLU
2	B	180	VAL
2	B	181	LYS
2	B	182	MET
2	B	184	ARG
2	B	222	GLU
2	B	225	GLU
3	R	48	ILE
3	R	71	VAL
3	R	88	ARG
3	R	89	ASN
3	R	92	ARG
3	R	107	GLN
3	R	119	LYS
3	R	122	LYS
3	R	123	TRP
3	R	130	TYR
3	R	142	VAL
3	R	145	THR
3	R	155	LEU
3	R	159	GLU
3	R	163	ARG
3	R	168	LEU
3	R	184	SER
3	R	192	ARG
3	R	202	THR
3	R	233	GLU
3	R	234	LYS
3	R	235	GLN
1	C	29	ASN
1	C	39	LEU
1	C	50	ARG
1	C	52	SER

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Mol	Chain	Res	Type
1	C	71	LEU
1	C	82	LEU
1	C	88	ARG
1	C	93	ARG
1	C	106	LEU
1	C	124	ARG
1	C	151	LYS
1	C	152	LEU
1	C	168	LEU
1	C	176	GLU
2	D	35	LEU
2	D	44	LEU
2	D	49	LYS
2	D	52	LEU
2	D	58	ILE
2	D	63	THR
2	D	97	CYS
2	D	114	ARG
2	D	120	GLN
2	D	125	SER
2	D	139	THR
2	D	140	ARG
2	D	145	ILE
2	D	177	GLU
2	D	180	VAL
2	D	181	LYS
2	D	182	MET
2	D	184	ARG
2	D	203	VAL
2	D	222	GLU
2	D	225	GLU
3	E	43	ILE
3	E	48	ILE
3	E	71	VAL
3	E	88	ARG
3	E	104	TYR
3	E	122	LYS
3	E	130	TYR
3	E	142	VAL
3	E	155	LEU
3	E	159	GLU
3	E	168	LEU

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Mol	Chain	Res	Type
3	E	170	VAL
3	E	184	SER
3	E	192	ARG
3	E	195	SER
3	E	200	ASN
3	E	202	THR
3	E	220	SER
3	E	221	PHE
3	E	232	SER
3	E	233	GLU
3	E	234	LYS
3	E	235	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	GLN
1	A	72	GLN
1	A	78	ASN
1	A	144	GLN
2	B	47	ASN
2	B	110	ASN
2	B	120	GLN
2	B	134	GLN
2	B	206	GLN
3	R	42	ASN
3	R	52	ASN
3	R	55	GLN
3	R	63	GLN
3	R	89	ASN
3	R	136	GLN
3	R	235	GLN
1	C	29	ASN
1	C	40	GLN
1	C	54	GLN
2	D	110	ASN
2	D	120	GLN
2	D	134	GLN
2	D	206	GLN
3	E	42	ASN
3	E	52	ASN
3	E	63	GLN

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Mol	Chain	Res	Type
3	E	89	ASN
3	E	106	HIS
3	E	136	GLN
3	E	211	ASN
3	E	235	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 ⓘ

5 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	NAG	E	301	-	14,14,15	1.64	2 (14%)	17,19,21	5.38	3 (17%)
4	NAG	D	301	-	14,14,15	0.55	0	17,19,21	1.99	3 (17%)
4	NAG	B	301	-	14,14,15	0.85	0	17,19,21	1.37	3 (17%)
4	NAG	R	302	-	14,14,15	0.70	0	17,19,21	1.71	2 (11%)
4	NAG	R	301	-	14,14,15	0.59	0	17,19,21	1.46	3 (17%)

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	E	301	-	-	4/6/23/26	0/1/1/1
4	NAG	D	301	-	-	1/6/23/26	0/1/1/1
4	NAG	B	301	-	-	3/6/23/26	0/1/1/1
4	NAG	R	302	-	-	4/6/23/26	0/1/1/1
4	NAG	R	301	-	-	2/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	301	NAG	O5-C1	-4.98	1.35	1.43
4	E	301	NAG	C1-C2	-2.21	1.49	1.52

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	301	NAG	O5-C1-C2	20.83	143.51	111.29
4	D	301	NAG	C2-N2-C7	-6.33	114.41	122.90
4	E	301	NAG	C1-O5-C5	-5.48	104.85	112.19
4	R	302	NAG	O5-C1-C2	-4.75	103.95	111.29
4	E	301	NAG	C3-C4-C5	4.34	118.11	110.23
4	R	302	NAG	C3-C4-C5	3.43	116.44	110.23
4	R	301	NAG	C3-C4-C5	3.13	115.91	110.23
4	R	301	NAG	C1-C2-N2	-2.80	106.03	110.43
4	D	301	NAG	C1-O5-C5	2.55	115.60	112.19
4	B	301	NAG	O7-C7-C8	-2.45	117.69	122.05
4	R	301	NAG	C2-N2-C7	-2.31	119.80	122.90
4	B	301	NAG	C1-O5-C5	2.19	115.13	112.19
4	D	301	NAG	O4-C4-C3	-2.13	105.36	110.38
4	B	301	NAG	O5-C5-C4	2.11	115.95	110.83

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	R	302	NAG	O7-C7-N2-C2
4	E	301	NAG	O5-C5-C6-O6
4	R	302	NAG	C8-C7-N2-C2
4	R	302	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
4	R	302	NAG	C4-C5-C6-O6
4	E	301	NAG	C4-C5-C6-O6
4	B	301	NAG	C4-C5-C6-O6
4	R	301	NAG	C4-C5-C6-O6
4	B	301	NAG	O5-C5-C6-O6
4	E	301	NAG	C8-C7-N2-C2
4	E	301	NAG	O7-C7-N2-C2
4	B	301	NAG	C3-C2-N2-C7
4	D	301	NAG	C8-C7-N2-C2
4	R	301	NAG	O5-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	301	NAG	4	0
4	D	301	NAG	1	0
4	B	301	NAG	2	0
4	R	302	NAG	7	0
4	R	301	NAG	2	0

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	153/153 (100%)	-0.52	2 (1%)	74	67	28, 48, 72, 104	0
1	C	153/153 (100%)	-0.56	0	100	100	27, 49, 73, 102	0
2	B	193/206 (93%)	-0.27	5 (2%)	57	49	34, 55, 93, 110	0
2	D	193/206 (93%)	-0.04	9 (4%)	37	30	34, 55, 98, 116	0
3	E	204/221 (92%)	0.28	20 (9%)	14	11	41, 67, 114, 134	0
3	R	204/221 (92%)	0.22	13 (6%)	27	20	40, 66, 112, 133	0
All	All	1100/1160 (94%)	-0.11	49 (4%)	39	31	27, 57, 101, 134	0

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	176	GLU	5.4
2	D	60	PRO	4.8
2	D	58	ILE	4.6
3	E	168	LEU	4.2
2	D	34	ILE	4.0
3	E	229	ALA	4.0
3	R	121	SER	3.8
2	D	117	LEU	3.4
3	R	66	LYS	3.4
3	R	39	LYS	3.3
3	R	63	GLN	3.2
2	B	62	GLU	3.1
3	E	62	LEU	3.1
2	D	59	ALA	3.1
3	E	121	SER	3.1
2	D	226	VAL	3.0
3	R	62	LEU	3.0
3	R	122	LYS	3.0
2	D	36	PRO	2.9

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Mol	Chain	Res	Type	RSRZ
3	R	168	LEU	2.9
3	R	65	VAL	2.9
3	R	118	THR	2.9
3	E	39	LYS	2.8
3	E	230	GLN	2.8
3	E	232	SER	2.8
3	E	65	VAL	2.8
3	E	118	THR	2.8
3	E	119	LYS	2.8
2	B	58	ILE	2.7
3	E	46	LEU	2.7
2	D	62	GLU	2.6
2	D	61	GLY	2.6
3	R	229	ALA	2.6
3	E	234	LYS	2.6
2	B	34	ILE	2.5
3	E	64	GLY	2.4
3	E	165	PRO	2.3
3	R	116	TRP	2.3
3	E	148	GLU	2.3
2	B	91	LEU	2.3
3	R	119	LYS	2.3
1	A	140	LYS	2.2
3	E	226	PRO	2.2
3	E	231	PRO	2.2
3	E	242	ASP	2.2
2	B	117	LEU	2.1
3	E	233	GLU	2.1
3	E	61	GLY	2.1
3	R	64	GLY	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	B	301	14/15	0.56	0.17	54,58,61,64	0
4	NAG	R	301	14/15	0.68	0.14	49,51,54,54	0
4	NAG	R	302	14/15	0.72	0.15	49,51,54,54	0
4	NAG	D	301	14/15	0.74	0.15	54,58,61,64	0
4	NAG	E	301	14/15	0.83	0.13	49,51,54,54	0

6.5 Other polymers ⓘ

There are no such residues in this entry.