



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 12, 2023 – 05:22 pm GMT

PDB ID : 2XAV
Title : Ribonucleotide reductase Y731NO2Y and Y730F modified R1 subunit of E. coli
Authors : Yokoyama, K.; Uhlin, U.; Stubbe, J.
Deposited on : 2010-03-31
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 ⓘ 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
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

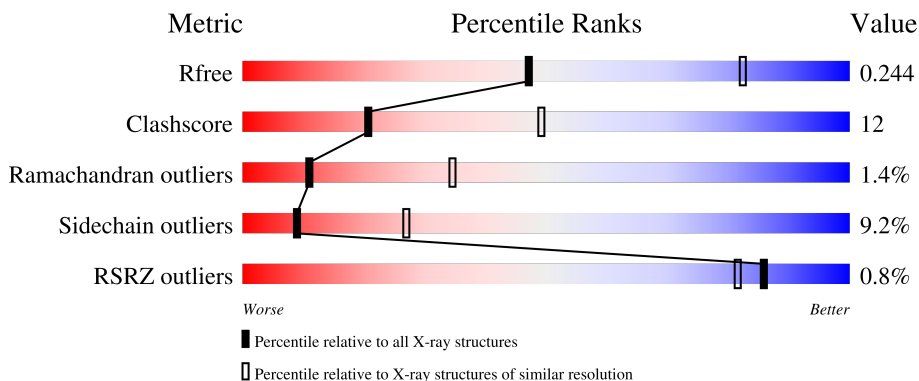
1 Overall quality at a glance i

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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (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 $\leq 5\%$. 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	761	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 70%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 5px;">70% 22% . .</p>
1	B	761	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 67%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 24%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 5px;">67% 24% . . .</p>
1	C	761	<div style="display: flex; align-items: center;"> <div style="width: 71%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 5px;">71% 22% . .</p>
2	D	20	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 40%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 30%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 20%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 5px;">5% 40% 30% 10% 20%</p>
2	E	20	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 55%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 20%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 20%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 5px;">5% 55% 20% 5% 20%</p>

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Mol	Chain	Length	Quality of chain
2	F	20	 50% 30% 20%
2	P	20	 15% 85%

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 18459 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 RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT ALPHA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	728	5806	3688	996	1098	24	0	0	0
1	B	728	5806	3688	996	1098	24	0	0	0
1	C	728	5806	3688	996	1098	24	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	730	PHE	TYR	engineered mutation	UNP P00452
B	730	PHE	TYR	engineered mutation	UNP P00452
C	730	PHE	TYR	engineered mutation	UNP P00452

- Molecule 2 is a protein called RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT BETA.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	D	16	129	77	19	33	0	0	0
2	E	16	129	77	19	33	0	0	0
2	F	16	129	77	19	33	0	0	0
2	P	3	27	20	3	4	0	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	176	Total	O	0	0
			176	176		

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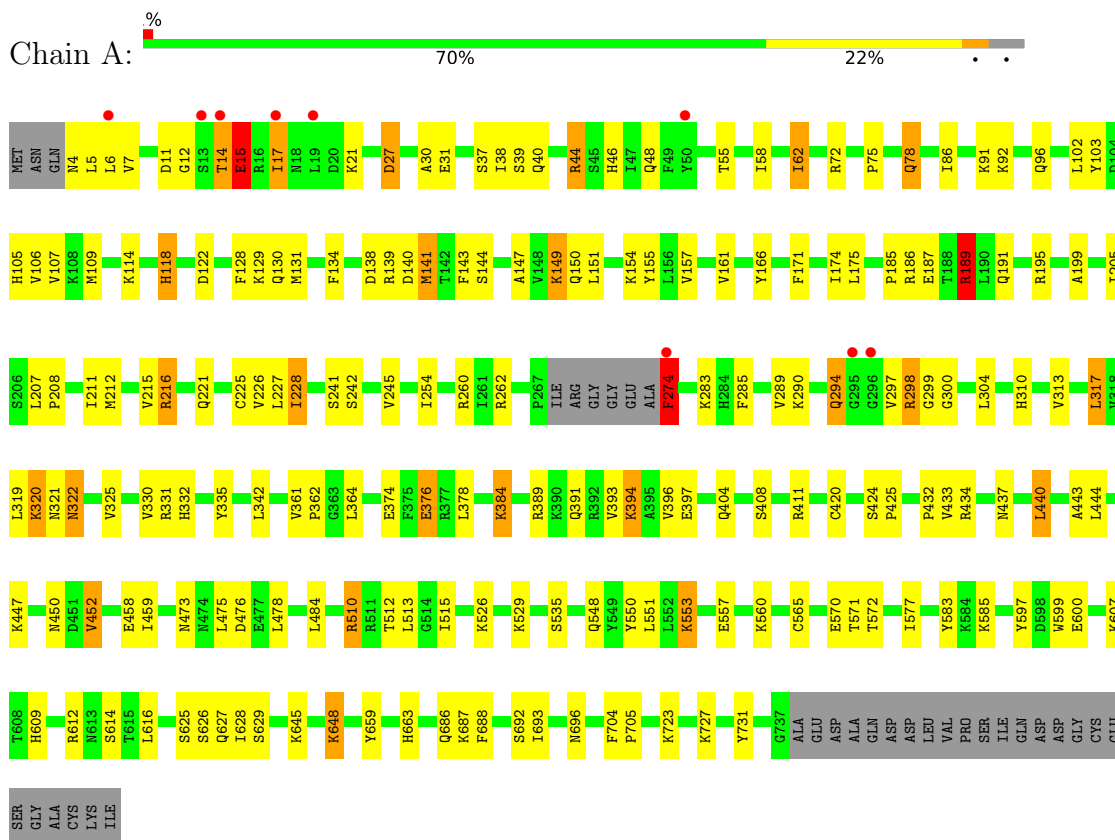
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	183	Total O 183 183	0	0
3	C	259	Total O 259 259	0	0
3	D	2	Total O 2 2	0	0
3	F	3	Total O 3 3	0	0
3	P	4	Total O 4 4	0	0

3 Residue-property plots i

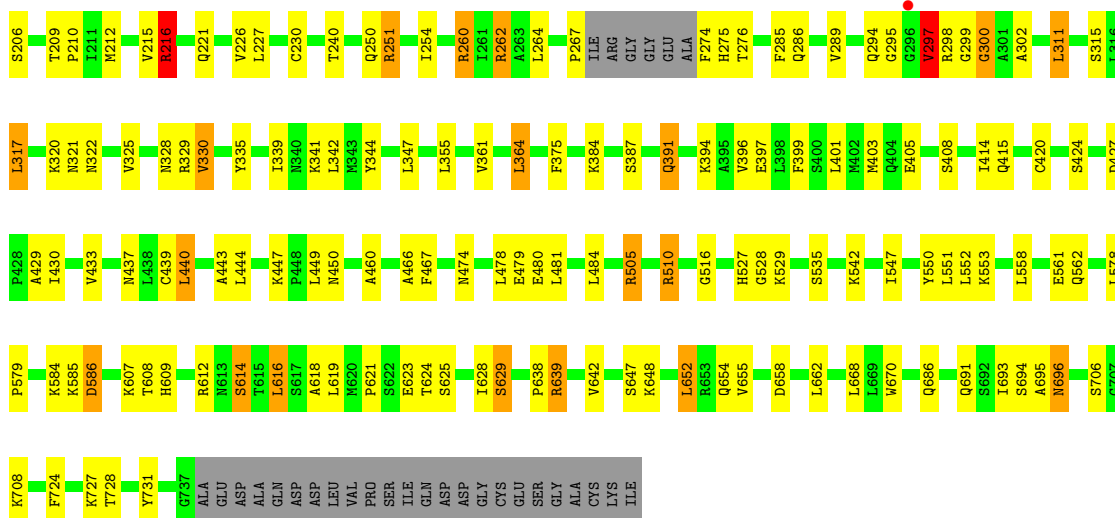
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT ALPHA



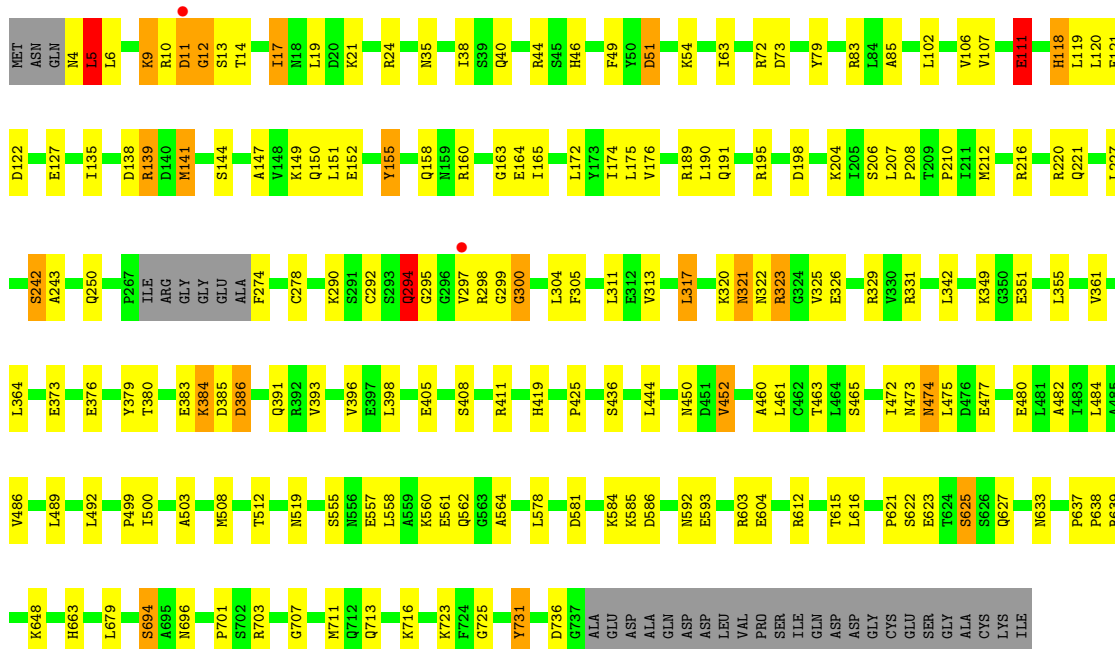
• Molecule 1: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT ALPHA





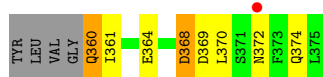
• Molecule 1: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT ALPHA

Chain C: 71% 22%



• Molecule 2: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT BETA

Chain D: 5% 40% 30% 10% 20%



• Molecule 2: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT BETA

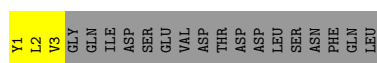
Chain E: 5% 55% 20% 5% 20%



- Molecule 2: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT BETA



- Molecule 2: RIBONUCLEOSIDE-DIPHOSPHATE REDUCTASE 1 SUBUNIT BETA



4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α , β , γ	224.66Å 224.66Å 336.36Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	169.03 – 2.80 84.21 – 2.80	Depositor EDS
% Data completeness (in resolution range)	93.7 (169.03-2.80) 93.6 (84.21-2.80)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.46 (at 2.82Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.169 , 0.247 0.169 , 0.244	Depositor DCC
R_{free} test set	3787 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	44.3	Xtrriage
Anisotropy	0.031	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 55.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	18459	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.18% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: NIY

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	0.69	1/5916 (0.0%)	0.75	0/8010
1	B	0.69	1/5916 (0.0%)	0.78	5/8010 (0.1%)
1	C	0.82	3/5916 (0.1%)	0.83	1/8010 (0.0%)
2	D	0.58	0/129	0.66	0/173
2	E	0.66	0/129	0.79	0/173
2	F	0.61	0/129	0.73	0/173
2	P	0.85	0/27	0.98	0/36
All	All	0.73	5/18162 (0.0%)	0.78	6/24585 (0.0%)

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

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

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	278	CYS	CB-SG	-7.21	1.70	1.82
1	B	187	GLU	CG-CD	6.58	1.61	1.51
1	C	111	GLU	CG-CD	6.48	1.61	1.51
1	C	155	TYR	CE1-CZ	5.49	1.45	1.38
1	A	225	CYS	CB-SG	-5.16	1.73	1.81

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	505	ARG	NE-CZ-NH2	-6.30	117.15	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	616	LEU	CA-CB-CG	-5.61	102.41	115.30
1	B	264	LEU	CA-CB-CG	5.50	127.95	115.30
1	C	703	ARG	NE-CZ-NH1	5.29	122.95	120.30
1	B	180	LEU	CA-CB-CG	5.11	127.04	115.30
1	B	72	ARG	NE-CZ-NH1	-5.08	117.76	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	274	PHE	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	5806	0	5725	138	0
1	B	5806	0	5726	149	0
1	C	5806	0	5725	142	0
2	D	129	0	111	4	0
2	E	129	0	111	2	0
2	F	129	0	111	2	0
2	P	27	0	31	3	0
3	A	176	0	0	42	0
3	B	183	0	0	52	1
3	C	259	0	0	50	1
3	D	2	0	0	1	0
3	F	3	0	0	0	0
3	P	4	0	0	2	0
All	All	18459	0	17540	436	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

All (436) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:299:GLY:HA3	3:A:2073:HOH:O	1.51	1.11
1:C:480:GLU:HB3	3:C:2070:HOH:O	1.59	1.03
1:A:294:GLN:HB2	1:A:298:ARG:HH11	1.23	1.02
1:B:204:LYS:HB3	3:B:2057:HOH:O	1.59	1.01
1:A:450:ASN:HB2	3:A:2120:HOH:O	1.60	1.00
1:B:275:HIS:HB2	3:B:2030:HOH:O	1.61	1.00
1:A:118:HIS:HB3	3:A:2034:HOH:O	1.61	0.99
1:B:552:LEU:HB2	3:B:2141:HOH:O	1.66	0.94
1:A:14:THR:O	1:A:15:GLU:HB3	1.69	0.93
1:C:473:ASN:HB3	3:C:2167:HOH:O	1.68	0.92
1:B:387:SER:HB2	3:B:2105:HOH:O	1.68	0.92
1:C:118:HIS:CE1	3:C:2044:HOH:O	2.23	0.91
1:B:474:ASN:HB2	3:B:2122:HOH:O	1.70	0.89
1:C:9:LYS:HD3	1:C:10:ARG:H	1.37	0.88
1:A:384:LYS:HE3	1:A:384:LYS:HA	1.56	0.86
1:C:141:MET:CG	3:C:2015:HOH:O	2.24	0.84
1:B:230:CYS:O	1:B:260:ARG:HD2	1.78	0.84
1:A:260:ARG:HH21	1:A:434:ARG:HH22	1.26	0.83
1:B:450:ASN:HB2	3:B:2116:HOH:O	1.78	0.83
1:C:561:GLU:HG2	1:C:562:GLN:HG3	1.60	0.83
1:A:262:ARG:HG2	1:A:274:PHE:HB2	1.62	0.82
1:B:118:HIS:HB3	3:B:2032:HOH:O	1.79	0.82
1:A:30:ALA:HB3	3:A:2008:HOH:O	1.79	0.81
1:B:558:LEU:HD23	1:B:612:ARG:HG2	1.62	0.81
1:B:480:GLU:HB3	3:B:2051:HOH:O	1.80	0.81
1:C:160:ARG:HB2	3:C:2058:HOH:O	1.80	0.81
1:C:122:ASP:O	1:C:189:ARG:NH2	2.15	0.79
1:C:141:MET:HG2	3:C:2015:HOH:O	1.81	0.79
1:A:141:MET:HG2	3:A:2009:HOH:O	1.84	0.77
1:C:14:THR:HG23	3:C:2010:HOH:O	1.83	0.77
1:B:274:PHE:HD1	3:B:2073:HOH:O	1.66	0.76
1:B:75:PRO:O	1:B:78:GLN:HB2	1.85	0.76
1:B:92:LYS:HD3	3:B:2044:HOH:O	1.85	0.76
1:B:619:LEU:HD12	1:B:693:ILE:HG12	1.67	0.76
1:C:450:ASN:HB2	3:C:2157:HOH:O	1.83	0.76
1:C:163:GLY:HA3	3:C:2060:HOH:O	1.85	0.75
1:C:195:ARG:HD3	3:C:2071:HOH:O	1.86	0.75
1:A:548:GLN:OE1	1:A:548:GLN:HA	1.85	0.75
1:C:72:ARG:HD2	3:C:2029:HOH:O	1.87	0.74
1:A:150:GLN:NE2	1:A:627:GLN:OE1	2.21	0.74
1:A:46:HIS:HB3	3:A:2020:HOH:O	1.87	0.74
1:C:73:ASP:HA	3:C:2028:HOH:O	1.87	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:10:ARG:HG2	3:B:2003:HOH:O	1.88	0.73
1:C:11:ASP:HB3	3:C:2009:HOH:O	1.87	0.73
1:B:387:SER:CB	3:B:2105:HOH:O	2.30	0.73
1:A:139:ARG:HD3	3:A:2044:HOH:O	1.89	0.72
1:C:111:GLU:HG2	3:C:2041:HOH:O	1.89	0.72
1:A:208:PRO:HD2	1:A:211:ILE:HD12	1.70	0.72
1:A:207:LEU:HD12	1:A:212:MET:CE	2.20	0.72
1:C:450:ASN:CB	3:C:2157:HOH:O	2.37	0.72
1:A:260:ARG:HH21	1:A:434:ARG:NH2	1.88	0.71
1:B:561:GLU:HG2	1:B:562:GLN:HG3	1.72	0.71
1:A:122:ASP:O	1:A:189:ARG:NH2	2.24	0.70
1:B:433:VAL:HG11	1:B:443:ALA:HB1	1.73	0.70
1:A:384:LYS:HD2	3:A:2104:HOH:O	1.91	0.70
1:C:294:GLN:HB2	1:C:298:ARG:HB2	1.71	0.70
1:B:99:PRO:HG2	1:B:137:HIS:CD2	2.26	0.70
1:A:221:GLN:HG2	3:A:2071:HOH:O	1.90	0.69
1:B:527:HIS:HE1	3:B:2132:HOH:O	1.74	0.69
1:B:443:ALA:O	1:B:444:LEU:HD23	1.93	0.69
1:C:4:ASN:N	3:C:2002:HOH:O	2.26	0.69
1:B:91:LYS:HD2	3:B:2029:HOH:O	1.91	0.69
1:A:600:GLU:HG2	3:A:2153:HOH:O	1.92	0.68
1:A:114:LYS:HE2	1:A:166:TYR:HE2	1.56	0.68
1:A:103:TYR:O	1:A:107:VAL:HG23	1.94	0.68
1:B:527:HIS:CE1	3:B:2132:HOH:O	2.45	0.68
1:C:40:GLN:HE21	1:C:44:ARG:HD2	1.58	0.68
1:C:79:TYR:O	1:C:83:ARG:HG3	1.94	0.68
1:A:195:ARG:CD	3:A:2057:HOH:O	2.42	0.67
1:C:139:ARG:HD3	3:C:2051:HOH:O	1.94	0.67
1:B:415:GLN:HG3	1:B:728:THR:HG22	1.77	0.67
1:B:481:LEU:HD13	3:B:2057:HOH:O	1.95	0.67
1:A:139:ARG:CD	3:A:2044:HOH:O	2.43	0.67
1:B:300:GLY:HA2	3:B:2082:HOH:O	1.95	0.67
1:B:481:LEU:CD1	3:B:2057:HOH:O	2.43	0.67
1:B:15:GLU:HG3	3:B:2006:HOH:O	1.95	0.66
1:B:91:LYS:HE3	3:B:2002:HOH:O	1.95	0.66
1:B:108:LYS:O	1:B:112:MET:HG3	1.95	0.66
1:A:686:GLN:NE2	1:A:727:LYS:HE3	2.10	0.66
1:C:508:MET:HE2	1:C:508:MET:HA	1.76	0.66
1:A:290:LYS:HE3	1:A:332:HIS:HB3	1.78	0.65
1:A:609:HIS:HE1	3:A:2154:HOH:O	1.78	0.65
1:A:207:LEU:HD12	1:A:212:MET:HE3	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:72:ARG:CD	3:C:2029:HOH:O	2.43	0.65
1:A:212:MET:O	1:A:216:ARG:NH2	2.26	0.65
1:B:11:ASP:CG	1:B:12:GLY:H	1.99	0.65
1:A:510:ARG:NH2	1:A:570:GLU:OE1	2.30	0.65
1:A:242:SER:HB2	1:A:452:VAL:HG13	1.79	0.64
1:A:294:GLN:HB2	1:A:298:ARG:NH1	2.06	0.64
1:A:199:ALA:HB1	1:A:205:ILE:HD12	1.79	0.64
1:A:195:ARG:HD3	3:A:2057:HOH:O	1.98	0.64
1:C:139:ARG:NH2	1:C:198:ASP:OD1	2.31	0.64
1:C:274:PHE:HD1	3:C:2100:HOH:O	1.80	0.63
1:A:299:GLY:CA	3:A:2073:HOH:O	2.25	0.63
1:A:215:VAL:O	1:A:216:ARG:HB3	1.99	0.63
1:C:17:ILE:CD1	1:C:19:LEU:HD23	2.28	0.63
1:C:40:GLN:NE2	1:C:44:ARG:HD2	2.14	0.63
1:B:250:GLN:O	1:B:251:ARG:HB2	1.97	0.63
1:B:311:LEU:HD12	1:B:311:LEU:O	2.00	0.62
1:B:275:HIS:HB3	3:B:2076:HOH:O	2.00	0.62
1:B:56:SER:O	1:B:60:GLU:HG2	1.99	0.62
1:B:311:LEU:HA	1:B:355:LEU:HB3	1.81	0.62
1:C:46:HIS:CE1	3:C:2020:HOH:O	2.52	0.61
1:A:27:ASP:HA	3:A:2008:HOH:O	2.01	0.61
1:B:122:ASP:O	1:B:189:ARG:NH2	2.33	0.61
1:C:242:SER:HB3	1:C:452:VAL:HG13	1.81	0.61
1:B:505:ARG:HD3	3:B:2117:HOH:O	2.01	0.61
1:C:9:LYS:NZ	1:C:10:ARG:HG3	2.16	0.61
2:P:3:VAL:HG23	3:P:2004:HOH:O	2.00	0.61
1:A:44:ARG:O	1:A:48:GLN:NE2	2.34	0.60
1:A:396:VAL:HG23	3:A:2095:HOH:O	2.00	0.60
1:B:275:HIS:CB	3:B:2030:HOH:O	2.33	0.60
1:C:46:HIS:HE1	3:C:2020:HOH:O	1.85	0.60
1:B:642:VAL:HG22	1:B:655:VAL:HG22	1.83	0.60
1:B:99:PRO:HG2	1:B:137:HIS:CG	2.36	0.60
1:B:215:VAL:O	1:B:216:ARG:HB3	1.99	0.60
1:C:411:ARG:NH1	1:C:731:NIY:HE2	2.17	0.60
1:A:583:TYR:CE2	1:A:687:LYS:HE3	2.37	0.60
1:C:227:LEU:HB2	1:C:460:ALA:HB3	1.84	0.59
1:C:274:PHE:HA	3:C:2100:HOH:O	2.01	0.59
1:B:212:MET:O	1:B:216:ARG:NH2	2.36	0.59
1:A:432:PRO:HG3	3:A:2113:HOH:O	2.02	0.59
1:B:138:ASP:O	1:B:141:MET:HB2	2.02	0.59
1:A:140:ASP:HA	1:A:143:PHE:CE2	2.38	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:130:GLN:HG2	3:A:2040:HOH:O	2.02	0.59
1:A:75:PRO:O	1:A:78:GLN:HB2	2.03	0.59
2:D:360:GLN:HB2	3:D:2001:HOH:O	2.04	0.58
1:C:158:GLN:HB2	1:C:164:GLU:O	2.03	0.58
2:P:3:VAL:HA	3:P:2002:HOH:O	2.04	0.58
1:C:508:MET:HA	1:C:508:MET:CE	2.33	0.58
1:B:317:LEU:HD23	1:B:401:LEU:HD23	1.84	0.58
1:C:17:ILE:CD1	1:C:19:LEU:CD2	2.82	0.58
1:C:701:PRO:O	1:C:707:GLY:HA2	2.04	0.58
1:A:322:ASN:ND2	1:A:322:ASN:H	2.01	0.58
1:B:7:VAL:HG12	1:B:8:THR:N	2.19	0.58
1:B:297:VAL:HG12	3:B:2080:HOH:O	2.03	0.58
1:A:7:VAL:HG21	1:A:17:ILE:HG12	1.87	0.57
1:C:592:ASN:O	1:C:593:GLU:C	2.39	0.57
1:B:59:HIS:HE1	1:B:91:LYS:HE2	1.68	0.57
1:B:299:GLY:HA3	3:B:2081:HOH:O	2.04	0.57
1:C:17:ILE:HD12	1:C:19:LEU:CD2	2.35	0.57
1:C:444:LEU:HD22	1:C:512:THR:HG21	1.86	0.57
1:B:696:ASN:N	1:B:696:ASN:HD22	2.02	0.57
1:C:150:GLN:NE2	1:C:627:GLN:OE1	2.33	0.56
1:A:553:LYS:O	1:A:557:GLU:HG2	2.05	0.56
1:A:141:MET:CG	3:A:2009:HOH:O	2.48	0.56
1:B:275:HIS:HE1	3:B:2074:HOH:O	1.89	0.56
1:B:621:PRO:HD3	1:B:694:SER:CB	2.35	0.56
1:C:12:GLY:HA2	3:C:2008:HOH:O	2.05	0.56
1:A:374:GLU:HG3	1:A:378:LEU:HD12	1.87	0.56
1:B:322:ASN:HA	3:B:2086:HOH:O	2.06	0.55
1:A:174:ILE:HG23	1:A:175:LEU:HG	1.88	0.55
1:C:17:ILE:HD12	1:C:19:LEU:HD21	1.87	0.55
1:C:242:SER:HB3	1:C:452:VAL:CG1	2.36	0.55
1:C:9:LYS:HZ3	1:C:10:ARG:CG	2.20	0.55
1:B:9:LYS:HG2	3:B:2005:HOH:O	2.06	0.55
1:A:320:LYS:HA	1:A:331:ARG:HG2	1.89	0.54
1:C:557:GLU:HA	1:C:560:LYS:HD2	1.89	0.54
1:C:663:HIS:HD2	3:C:2226:HOH:O	1.89	0.54
1:A:144:SER:O	1:A:147:ALA:HB3	2.07	0.54
1:B:639:ARG:HE	1:B:670:TRP:HE1	1.56	0.54
1:A:40:GLN:HE21	1:A:44:ARG:HD2	1.73	0.53
1:C:107:VAL:HG12	3:C:2040:HOH:O	2.07	0.53
1:A:109:MET:HE2	1:A:114:LYS:HB2	1.90	0.53
1:C:321:ASN:O	1:C:329:ARG:HD2	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:11:ASP:CG	1:B:12:GLY:N	2.61	0.53
1:B:299:GLY:CA	3:B:2081:HOH:O	2.57	0.53
1:C:292:CYS:HB3	3:C:2107:HOH:O	2.08	0.53
1:C:625:SER:OG	3:C:2219:HOH:O	2.18	0.53
1:C:736:ASP:HA	3:C:2259:HOH:O	2.09	0.53
1:C:696:ASN:N	1:C:696:ASN:HD22	2.05	0.53
1:A:171:PHE:O	1:A:175:LEU:HD12	2.08	0.53
1:C:138:ASP:O	1:C:141:MET:HB2	2.08	0.53
1:C:322:ASN:O	1:C:323:ARG:HB2	2.09	0.53
1:A:447:LYS:HE3	3:A:2119:HOH:O	2.09	0.52
1:B:466:ALA:HA	1:B:516:GLY:O	2.08	0.52
1:C:604:GLU:HG2	3:C:2212:HOH:O	2.09	0.52
1:B:195:ARG:HD3	3:B:2053:HOH:O	2.08	0.52
1:C:5:LEU:HA	1:C:51:ASP:OD1	2.10	0.52
1:C:558:LEU:CD2	1:C:612:ARG:HG2	2.39	0.52
1:A:114:LYS:HE2	1:A:166:TYR:CE2	2.42	0.52
1:C:313:VAL:HG22	1:C:317:LEU:HD22	1.91	0.52
1:C:463:THR:HG21	1:C:492:LEU:HD23	1.91	0.52
1:B:260:ARG:HG3	3:B:2069:HOH:O	2.09	0.52
1:C:118:HIS:HB3	3:C:2043:HOH:O	2.09	0.52
1:C:713:GLN:HA	3:C:2252:HOH:O	2.08	0.52
1:C:294:GLN:CB	1:C:298:ARG:HB2	2.40	0.52
1:A:304:LEU:O	1:A:335:TYR:HA	2.09	0.52
1:C:9:LYS:NZ	1:C:10:ARG:CG	2.73	0.52
1:B:151:LEU:HA	1:B:155:TYR:HB2	1.92	0.52
1:B:116:ASP:CG	1:B:118:HIS:CD2	2.83	0.51
1:A:241:SER:O	1:A:245:VAL:HG23	2.09	0.51
1:A:663:HIS:HB2	3:A:2162:HOH:O	2.09	0.51
1:C:384:LYS:HD2	3:C:2143:HOH:O	2.09	0.51
1:B:439:CYS:O	1:B:440:LEU:HB2	2.10	0.51
1:A:394:LYS:HB2	1:A:397:GLU:HG3	1.92	0.51
1:A:585:LYS:HE3	3:A:2150:HOH:O	2.10	0.51
1:A:560:LYS:HE2	1:A:609:HIS:CD2	2.45	0.51
1:B:708:LYS:HB3	2:E:362:ASP:HB2	1.93	0.51
1:C:342:LEU:HD12	1:C:376:GLU:HG3	1.93	0.51
1:A:450:ASN:CB	3:A:2120:HOH:O	2.34	0.51
1:B:285:PHE:O	1:B:289:VAL:HG23	2.09	0.51
1:C:425:PRO:HG2	1:C:615:THR:HG22	1.92	0.51
1:A:14:THR:O	1:A:15:GLU:CB	2.52	0.51
1:A:140:ASP:HA	1:A:143:PHE:CD2	2.45	0.51
1:B:7:VAL:HG12	1:B:8:THR:H	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:191:GLN:HB2	3:A:2054:HOH:O	2.10	0.51
1:B:695:ALA:C	1:B:696:ASN:HD22	2.14	0.51
1:B:203:PHE:HB3	1:B:629:SER:HB3	1.93	0.50
1:B:478:LEU:CD1	1:B:547:ILE:HG13	2.41	0.50
1:C:331:ARG:HD2	3:C:2120:HOH:O	2.11	0.50
1:A:285:PHE:O	1:A:289:VAL:HG23	2.11	0.50
1:A:648:LYS:HA	3:A:2165:HOH:O	2.11	0.50
1:C:163:GLY:CA	3:C:2060:HOH:O	2.53	0.50
1:A:109:MET:CE	1:A:114:LYS:HB2	2.42	0.50
1:A:227:LEU:HD11	1:A:437:ASN:HB3	1.93	0.50
1:B:119:LEU:HD21	1:B:179:CYS:SG	2.52	0.50
1:B:619:LEU:HB2	1:B:693:ILE:HG23	1.93	0.50
1:A:723:LYS:NZ	2:D:374:GLN:O	2.39	0.50
1:A:150:GLN:OE1	1:A:154:LYS:HD2	2.12	0.50
1:C:141:MET:HG3	3:C:2015:HOH:O	2.03	0.50
1:C:736:ASP:CA	3:C:2259:HOH:O	2.59	0.50
1:C:663:HIS:CD2	3:C:2226:HOH:O	2.63	0.49
1:B:109:MET:HB2	1:B:115:TYR:CD2	2.47	0.49
1:B:167:GLU:OE2	1:B:216:ARG:NH1	2.45	0.49
1:A:433:VAL:HG11	1:A:443:ALA:HB1	1.93	0.49
1:A:548:GLN:HB2	1:A:688:PHE:HB3	1.94	0.49
1:B:206:SER:OG	1:B:625:SER:HB2	2.11	0.49
1:B:399:PHE:O	1:B:403:MET:HG2	2.13	0.49
2:E:361:ILE:HD13	2:E:361:ILE:H	1.77	0.49
1:A:157:VAL:HG23	1:A:216:ARG:HH11	1.77	0.49
1:A:226:VAL:HG22	1:A:254:ILE:HG23	1.94	0.49
1:A:331:ARG:HD3	3:A:2093:HOH:O	2.13	0.49
1:B:437:ASN:HB2	3:B:2113:HOH:O	2.13	0.49
1:C:172:LEU:O	1:C:176:VAL:HG23	2.13	0.49
1:A:560:LYS:HE2	1:A:609:HIS:CG	2.47	0.49
1:A:609:HIS:CE1	3:A:2154:HOH:O	2.59	0.49
1:B:7:VAL:HG11	1:B:55:THR:HG23	1.94	0.49
1:C:46:HIS:HD2	1:C:49:PHE:CE2	2.30	0.49
1:A:458:GLU:OE2	1:A:510:ARG:NH1	2.45	0.49
1:B:79:TYR:O	1:B:83:ARG:HG3	2.12	0.49
1:B:126:GLU:CG	3:B:2035:HOH:O	2.59	0.49
1:B:150:GLN:HB2	1:B:628:ILE:HD11	1.93	0.49
1:A:105:HIS:CD2	1:A:171:PHE:CD2	3.01	0.49
1:B:114:LYS:HE3	3:B:2045:HOH:O	2.12	0.49
1:B:227:LEU:HB2	1:B:460:ALA:HB3	1.94	0.49
1:B:9:LYS:HD3	1:B:10:ARG:H	1.77	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:391:GLN:HG3	3:B:2106:HOH:O	2.12	0.48
1:C:349:LYS:O	1:C:351:GLU:HG3	2.14	0.48
1:C:581:ASP:HA	3:C:2200:HOH:O	2.13	0.48
1:A:515:ILE:HD12	1:A:551:LEU:HD22	1.96	0.48
1:A:425:PRO:O	1:A:571:THR:HB	2.14	0.48
1:B:15:GLU:HG2	1:B:16:ARG:N	2.27	0.48
1:C:9:LYS:HD3	1:C:10:ARG:N	2.18	0.48
1:A:440:LEU:N	1:A:440:LEU:CD2	2.76	0.48
1:B:344:TYR:O	1:B:347:LEU:HB3	2.14	0.48
1:A:38:ILE:HD11	3:A:2008:HOH:O	2.13	0.47
1:A:310:HIS:O	1:A:313:VAL:HG12	2.14	0.47
1:B:116:ASP:CG	1:B:118:HIS:HD2	2.18	0.47
1:A:58:ILE:O	1:A:62:ILE:HG23	2.15	0.47
1:C:311:LEU:HA	1:C:355:LEU:HB3	1.95	0.47
1:A:274:PHE:N	1:A:274:PHE:CD2	2.82	0.47
1:B:325:VAL:HG13	1:B:328:ASN:HB2	1.94	0.47
1:B:474:ASN:HB3	3:B:2121:HOH:O	2.14	0.47
1:B:115:TYR:CE1	1:B:216:ARG:HG3	2.50	0.47
1:B:553:LYS:HG2	3:B:2142:HOH:O	2.14	0.47
1:C:46:HIS:CD2	1:C:49:PHE:CE2	3.02	0.47
1:A:444:LEU:HD22	1:A:512:THR:HG21	1.96	0.47
1:B:558:LEU:CD2	1:B:612:ARG:HG2	2.39	0.47
1:C:584:LYS:NZ	1:C:586:ASP:OD1	2.43	0.47
1:A:319:LEU:HD22	1:A:330:VAL:HG23	1.95	0.47
1:A:663:HIS:CD2	3:A:2162:HOH:O	2.67	0.47
1:B:150:GLN:HB2	1:B:628:ILE:CD1	2.45	0.47
1:A:155:TYR:CE2	1:A:628:ILE:HD12	2.49	0.47
1:A:692:SER:OG	1:A:693:ILE:N	2.48	0.46
1:A:130:GLN:CG	3:A:2040:HOH:O	2.61	0.46
1:B:478:LEU:HD13	1:B:547:ILE:HG13	1.97	0.46
1:C:6:LEU:HD23	3:C:2011:HOH:O	2.15	0.46
1:A:195:ARG:HD2	3:A:2057:HOH:O	2.12	0.46
1:C:9:LYS:HZ2	1:C:10:ARG:HG3	1.79	0.46
1:C:208:PRO:HB2	1:C:210:PRO:HD2	1.98	0.46
1:B:149:LYS:HG3	1:B:652:LEU:HD11	1.97	0.46
1:B:547:ILE:HG23	3:B:2140:HOH:O	2.16	0.46
1:C:149:LYS:HD2	1:C:149:LYS:HA	1.68	0.46
1:C:290:LYS:HD2	1:C:297:VAL:HA	1.97	0.46
1:C:473:ASN:HB2	1:C:477:GLU:OE2	2.15	0.46
1:B:156:LEU:O	1:B:158:GLN:HG2	2.15	0.46
1:C:195:ARG:CD	3:C:2071:HOH:O	2.53	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:294:GLN:HB3	3:C:2109:HOH:O	2.15	0.46
1:B:9:LYS:HE2	3:B:2005:HOH:O	2.15	0.46
1:B:275:HIS:CE1	3:B:2074:HOH:O	2.66	0.46
1:A:207:LEU:HB2	1:A:212:MET:CE	2.46	0.46
1:B:27:ASP:HA	1:B:38:ILE:HD11	1.98	0.45
1:B:62:ILE:HD12	1:B:84:LEU:HD22	1.98	0.45
1:C:63:ILE:HD13	1:C:85:ALA:HA	1.98	0.45
1:C:313:VAL:HG22	1:C:317:LEU:CD2	2.46	0.45
1:C:207:LEU:HD23	1:C:465:SER:OG	2.16	0.45
1:A:376:GLU:HG2	3:A:2103:HOH:O	2.16	0.45
1:B:158:GLN:HB3	1:B:165:ILE:HG13	1.97	0.45
1:A:659:TYR:CE1	1:A:663:HIS:HB3	2.51	0.45
1:B:154:LYS:HD2	1:B:624:THR:HG21	1.98	0.45
1:A:149:LYS:HA	1:A:149:LYS:HE2	1.99	0.45
1:B:467:PHE:HE2	3:B:2140:HOH:O	1.99	0.45
1:B:639:ARG:NE	1:B:670:TRP:HE1	2.14	0.45
1:B:584:LYS:NZ	1:B:586:ASP:OD1	2.49	0.45
1:B:608:THR:CG2	1:B:609:HIS:CE1	3.00	0.45
1:C:419:HIS:CD2	1:C:725:GLY:HA2	2.52	0.45
1:A:322:ASN:H	1:A:322:ASN:HD22	1.65	0.45
1:A:572:THR:HB	1:A:577:ILE:HB	1.98	0.45
1:A:138:ASP:O	1:A:141:MET:HB2	2.17	0.45
1:C:120:LEU:HD13	2:P:1:TYR:CG	2.52	0.45
1:A:151:LEU:HA	1:A:155:TYR:HB2	1.99	0.44
1:A:394:LYS:HB2	1:A:397:GLU:CG	2.48	0.44
1:B:92:LYS:HB3	3:B:2044:HOH:O	2.17	0.44
1:B:686:GLN:CD	1:B:727:LYS:HD2	2.38	0.44
1:C:321:ASN:O	1:C:329:ARG:NE	2.50	0.44
1:C:398:LEU:HD12	1:C:398:LEU:HA	1.76	0.44
1:C:555:SER:HB2	1:C:616:LEU:HD21	1.99	0.44
1:B:361:VAL:HG21	1:B:364:LEU:HD12	1.98	0.44
1:C:102:LEU:O	1:C:106:VAL:HG23	2.18	0.44
1:C:384:LYS:HE3	1:C:384:LYS:HA	1.99	0.44
1:C:461:LEU:HD11	1:C:503:ALA:HB1	1.98	0.44
1:B:317:LEU:O	1:B:405:GLU:HG3	2.18	0.44
1:C:578:LEU:HD11	1:C:603:ARG:HB2	1.99	0.44
1:A:298:ARG:HA	3:A:2087:HOH:O	2.18	0.44
1:A:529:LYS:HD2	1:A:535:SER:O	2.17	0.44
1:C:135:ILE:HD11	1:C:174:ILE:HG21	2.00	0.44
1:C:221:GLN:CD	1:C:250:GLN:HG2	2.38	0.44
1:C:127:GLU:HG2	1:C:190:LEU:HD11	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:304:LEU:HD23	1:C:304:LEU:C	2.39	0.43
1:C:482:ALA:O	1:C:486:VAL:HG23	2.18	0.43
1:C:299:GLY:HA3	3:C:2114:HOH:O	2.18	0.43
1:B:479:GLU:HB2	1:B:550:TYR:CE1	2.54	0.43
1:B:618:ALA:HB2	1:B:691:GLN:HB2	1.99	0.43
1:C:195:ARG:NE	3:C:2071:HOH:O	2.51	0.43
1:A:114:LYS:HE3	3:A:2049:HOH:O	2.19	0.43
1:A:131:MET:HA	1:A:134:PHE:CD2	2.54	0.43
1:A:475:LEU:O	1:A:478:LEU:HB2	2.18	0.43
1:C:622:SER:O	1:C:633:ASN:HB3	2.18	0.43
1:A:420:CYS:O	1:A:424:SER:HB2	2.19	0.43
1:B:420:CYS:O	1:B:424:SER:HB2	2.19	0.43
1:B:230:CYS:HB2	1:B:240:THR:HG21	2.00	0.43
1:B:321:ASN:O	1:B:329:ARG:NE	2.51	0.43
1:B:639:ARG:CD	3:B:2157:HOH:O	2.66	0.43
1:C:499:PRO:O	1:C:500:ILE:HG12	2.18	0.43
1:A:186:ARG:HG2	3:A:2052:HOH:O	2.17	0.43
1:A:704:PHE:HA	1:A:705:PRO:HD2	1.78	0.43
1:B:621:PRO:HD3	1:B:694:SER:OG	2.19	0.43
1:C:118:HIS:HE1	3:C:2044:HOH:O	1.78	0.43
1:C:294:GLN:HB3	1:C:295:GLY:H	1.75	0.43
1:A:648:LYS:CA	3:A:2165:HOH:O	2.66	0.43
1:C:317:LEU:O	1:C:405:GLU:HG3	2.18	0.43
1:C:716:LYS:HE3	3:C:2253:HOH:O	2.19	0.43
1:A:4:ASN:N	3:A:2001:HOH:O	2.52	0.42
1:A:149:LYS:HE3	3:A:2046:HOH:O	2.19	0.42
1:B:53:ILE:HG23	1:B:53:ILE:O	2.19	0.42
1:B:330:VAL:HB	1:B:335:TYR:OH	2.19	0.42
1:C:144:SER:O	1:C:147:ALA:HB3	2.19	0.42
1:A:260:ARG:NH2	1:A:434:ARG:HH22	2.06	0.42
1:C:243:ALA:HA	1:C:500:ILE:CD1	2.50	0.42
1:A:86:ILE:HD12	1:A:140:ASP:HB3	2.02	0.42
1:A:475:LEU:HA	1:A:475:LEU:HD23	1.66	0.42
1:A:696:ASN:N	1:A:696:ASN:HD22	2.17	0.42
1:B:529:LYS:HD2	1:B:535:SER:O	2.19	0.42
1:C:305:PHE:CZ	1:C:436:SER:HB3	2.54	0.42
1:B:449:LEU:HD12	1:B:449:LEU:N	2.34	0.42
1:A:11:ASP:OD1	1:A:12:GLY:N	2.43	0.42
1:C:696:ASN:N	1:C:696:ASN:ND2	2.68	0.42
2:D:368:ASP:N	2:D:368:ASP:OD1	2.51	0.42
1:A:185:PRO:HB2	1:A:187:GLU:OE2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:427:ASP:OD1	1:B:429:ALA:N	2.48	0.42
1:B:578:LEU:HB3	1:B:579:PRO:HD2	2.02	0.42
1:B:262:ARG:HD3	1:B:274:PHE:HB3	2.01	0.42
1:C:118:HIS:HD2	1:C:220:ARG:HH22	1.68	0.42
1:A:476:ASP:OD1	1:A:550:TYR:OH	2.25	0.42
1:B:126:GLU:HG2	3:B:2035:HOH:O	2.19	0.42
1:C:450:ASN:HB2	3:C:2161:HOH:O	2.20	0.42
1:C:465:SER:HB2	1:C:489:LEU:HD11	2.01	0.42
1:A:565:CYS:HB3	1:A:612:ARG:O	2.20	0.41
1:B:267:PRO:C	3:B:2075:HOH:O	2.57	0.41
1:B:286:GLN:OE1	1:B:330:VAL:HG12	2.20	0.41
1:B:551:LEU:HG	3:B:2140:HOH:O	2.18	0.41
1:B:608:THR:HG21	1:B:609:HIS:CE1	2.55	0.41
1:C:321:ASN:O	1:C:329:ARG:CD	2.67	0.41
1:B:528:GLY:HA2	3:B:2168:HOH:O	2.20	0.41
1:B:642:VAL:HA	1:B:654:GLN:O	2.20	0.41
1:C:385:ASP:OD1	1:C:386:ASP:N	2.53	0.41
1:B:364:LEU:HD22	1:B:375:PHE:CE1	2.55	0.41
1:C:38:ILE:HG21	1:C:38:ILE:HD13	1.70	0.41
1:C:72:ARG:H	1:C:72:ARG:HG2	1.67	0.41
1:C:300:GLY:CA	3:C:2113:HOH:O	2.67	0.41
1:C:396:VAL:CG2	3:C:2128:HOH:O	2.68	0.41
1:B:134:PHE:CD1	1:B:194:LYS:HG3	2.56	0.41
1:C:46:HIS:HA	1:C:49:PHE:CD2	2.55	0.41
1:C:298:ARG:HG3	3:C:2109:HOH:O	2.20	0.41
1:C:475:LEU:HD23	1:C:475:LEU:HA	1.78	0.41
1:A:37:SER:HB3	1:A:40:GLN:HB2	2.01	0.41
1:A:102:LEU:O	1:A:106:VAL:HG23	2.21	0.41
1:A:228:ILE:HG23	1:A:459:ILE:HG12	2.01	0.41
1:B:209:THR:N	1:B:210:PRO:HD2	2.34	0.41
1:C:150:GLN:O	1:C:151:LEU:C	2.59	0.41
1:A:128:PHE:HA	1:A:131:MET:HE3	2.02	0.41
1:A:298:ARG:HB2	3:A:2083:HOH:O	2.21	0.41
1:A:215:VAL:O	1:A:216:ARG:CB	2.67	0.41
1:C:379:TYR:O	1:C:383:GLU:HG3	2.21	0.41
1:C:473:ASN:O	1:C:474:ASN:HB3	2.21	0.41
2:D:370:LEU:O	2:D:372:ASN:N	2.54	0.41
1:A:283:LYS:HG2	1:A:330:VAL:HG22	2.03	0.41
1:A:389:ARG:HD3	3:A:2108:HOH:O	2.20	0.41
1:B:9:LYS:CG	3:B:2005:HOH:O	2.68	0.41
1:B:179:CYS:SG	1:B:216:ARG:HA	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:254:ILE:O	1:B:302:ALA:HA	2.21	0.41
1:B:341:LYS:HE2	3:B:2096:HOH:O	2.20	0.41
1:C:155:TYR:CZ	1:C:212:MET:HG3	2.56	0.41
1:C:396:VAL:HG23	3:C:2128:HOH:O	2.21	0.41
1:C:637:PRO:HA	1:C:638:PRO:HD3	1.96	0.41
2:F:360:GLN:N	2:F:360:GLN:OE1	2.54	0.41
1:A:510:ARG:HB3	1:A:614:SER:OG	2.20	0.41
1:A:663:HIS:HD2	3:A:2162:HOH:O	2.02	0.41
1:B:396:VAL:HG23	3:B:2098:HOH:O	2.20	0.41
1:B:510:ARG:O	1:B:614:SER:OG	2.39	0.41
1:B:82:ALA:HB2	1:B:145:TYR:N	2.36	0.40
1:C:679:LEU:HD23	1:C:679:LEU:HA	1.97	0.40
1:C:711:MET:HE2	2:F:361:ILE:HD12	2.03	0.40
1:B:78:GLN:HG2	1:B:144:SER:HB2	2.01	0.40
1:B:109:MET:CB	1:B:115:TYR:CD2	3.03	0.40
1:B:138:ASP:HB2	3:B:2038:HOH:O	2.21	0.40
1:B:638:PRO:HG2	1:B:668:LEU:HD23	2.03	0.40
1:B:658:ASP:HB3	1:B:662:LEU:HD12	2.03	0.40
1:A:313:VAL:HG22	1:A:317:LEU:HD22	2.04	0.40
1:A:597:TYR:O	1:A:599:TRP:HD1	2.05	0.40
1:C:119:LEU:HD13	1:C:175:LEU:HD22	2.04	0.40
1:C:621:PRO:HD3	1:C:694:SER:OG	2.21	0.40
1:A:512:THR:O	1:A:513:LEU:HD23	2.22	0.40
1:B:102:LEU:O	1:B:106:VAL:HG23	2.22	0.40
1:B:724:PHE:O	3:B:2178:HOH:O	2.22	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:2011:HOH:O	3:C:2016:HOH:O[15_554]	2.06	0.14

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	723/761 (95%)	669 (92%)	44 (6%)	10 (1%)	11	34
1	B	723/761 (95%)	673 (93%)	39 (5%)	11 (2%)	10	33
1	C	723/761 (95%)	680 (94%)	34 (5%)	9 (1%)	13	39
2	D	14/20 (70%)	12 (86%)	2 (14%)	0	100	100
2	E	14/20 (70%)	10 (71%)	4 (29%)	0	100	100
2	F	14/20 (70%)	11 (79%)	2 (14%)	1 (7%)	1	2
2	P	1/20 (5%)	1 (100%)	0	0	100	100
All	All	2212/2363 (94%)	2056 (93%)	125 (6%)	31 (1%)	11	34

All (31) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	15	GLU
1	A	294	GLN
1	B	294	GLN
1	B	300	GLY
1	C	294	GLN
1	C	323	ARG
1	A	189	ARG
1	A	216	ARG
1	A	297	VAL
1	A	300	GLY
1	B	11	ASP
1	B	154	LYS
1	B	216	ARG
1	C	216	ARG
1	A	14	THR
1	A	31	GLU
1	B	12	GLY
1	B	55	THR
1	C	11	ASP
1	C	564	ALA
1	C	694	SER
2	F	373	PHE
1	A	362	PRO
1	B	189	ARG
1	B	297	VAL
1	C	300	GLY

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Mol	Chain	Res	Type
1	C	5	LEU
1	C	12	GLY
1	B	251	ARG
1	B	295	GLY
1	A	161	VAL

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	625/650 (96%)	572 (92%)	53 (8%)	10 31
1	B	625/650 (96%)	560 (90%)	65 (10%)	7 21
1	C	625/650 (96%)	579 (93%)	46 (7%)	13 37
2	D	16/19 (84%)	11 (69%)	5 (31%)	0 0
2	E	16/19 (84%)	12 (75%)	4 (25%)	0 2
2	F	16/19 (84%)	13 (81%)	3 (19%)	1 5
2	P	3/19 (16%)	2 (67%)	1 (33%)	0 0
All	All	1926/2026 (95%)	1749 (91%)	177 (9%)	9 27

All (177) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LEU
1	A	6	LEU
1	A	15	GLU
1	A	17	ILE
1	A	21	LYS
1	A	27	ASP
1	A	39	SER
1	A	44	ARG
1	A	55	THR
1	A	62	ILE
1	A	72	ARG
1	A	78	GLN

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Mol	Chain	Res	Type
1	A	91	LYS
1	A	92	LYS
1	A	96	GLN
1	A	118	HIS
1	A	129	LYS
1	A	141	MET
1	A	149	LYS
1	A	189	ARG
1	A	228	ILE
1	A	274	PHE
1	A	298	ARG
1	A	317	LEU
1	A	320	LYS
1	A	321	ASN
1	A	322	ASN
1	A	325	VAL
1	A	342	LEU
1	A	361	VAL
1	A	364	LEU
1	A	376	GLU
1	A	384	LYS
1	A	391	GLN
1	A	393	VAL
1	A	394	LYS
1	A	404	GLN
1	A	408	SER
1	A	411	ARG
1	A	440	LEU
1	A	452	VAL
1	A	473	ASN
1	A	484	LEU
1	A	510	ARG
1	A	526	LYS
1	A	553	LYS
1	A	607	LYS
1	A	616	LEU
1	A	625	SER
1	A	626	SER
1	A	629	SER
1	A	645	LYS
1	A	648	LYS
1	B	4	ASN

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Mol	Chain	Res	Type
1	B	9	LYS
1	B	11	ASP
1	B	14	THR
1	B	16	ARG
1	B	17	ILE
1	B	21	LYS
1	B	39	SER
1	B	44	ARG
1	B	55	THR
1	B	91	LYS
1	B	92	LYS
1	B	96	GLN
1	B	98	GLU
1	B	126	GLU
1	B	139	ARG
1	B	141	MET
1	B	158	GLN
1	B	160	ARG
1	B	161	VAL
1	B	165	ILE
1	B	183	ASN
1	B	189	ARG
1	B	191	GLN
1	B	216	ARG
1	B	221	GLN
1	B	226	VAL
1	B	260	ARG
1	B	262	ARG
1	B	276	THR
1	B	297	VAL
1	B	298	ARG
1	B	311	LEU
1	B	315	SER
1	B	317	LEU
1	B	320	LYS
1	B	330	VAL
1	B	339	ILE
1	B	342	LEU
1	B	364	LEU
1	B	384	LYS
1	B	391	GLN
1	B	394	LYS

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Mol	Chain	Res	Type
1	B	397	GLU
1	B	408	SER
1	B	414	ILE
1	B	430	ILE
1	B	440	LEU
1	B	447	LYS
1	B	484	LEU
1	B	510	ARG
1	B	542	LYS
1	B	585	LYS
1	B	586	ASP
1	B	607	LYS
1	B	614	SER
1	B	616	LEU
1	B	623	GLU
1	B	629	SER
1	B	639	ARG
1	B	647	SER
1	B	648	LYS
1	B	652	LEU
1	B	696	ASN
1	B	706	SER
1	C	5	LEU
1	C	9	LYS
1	C	13	SER
1	C	17	ILE
1	C	21	LYS
1	C	24	ARG
1	C	35	ASN
1	C	51	ASP
1	C	54	LYS
1	C	111	GLU
1	C	118	HIS
1	C	121	GLU
1	C	139	ARG
1	C	141	MET
1	C	152	GLU
1	C	165	ILE
1	C	191	GLN
1	C	204	LYS
1	C	206	SER
1	C	242	SER

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Mol	Chain	Res	Type
1	C	294	GLN
1	C	317	LEU
1	C	320	LYS
1	C	321	ASN
1	C	325	VAL
1	C	326	GLU
1	C	361	VAL
1	C	364	LEU
1	C	373	GLU
1	C	380	THR
1	C	384	LYS
1	C	386	ASP
1	C	391	GLN
1	C	393	VAL
1	C	408	SER
1	C	452	VAL
1	C	472	ILE
1	C	474	ASN
1	C	484	LEU
1	C	519	ASN
1	C	585	LYS
1	C	623	GLU
1	C	625	SER
1	C	639	ARG
1	C	648	LYS
1	C	723	LYS
2	D	360	GLN
2	D	361	ILE
2	D	364	GLU
2	D	368	ASP
2	D	369	ASP
2	E	360	GLN
2	E	361	ILE
2	E	364	GLU
2	E	367	THR
2	F	364	GLU
2	F	367	THR
2	F	374	GLN
2	P	2	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	40	GLN
1	A	46	HIS
1	A	183	ASN
1	A	250	GLN
1	A	321	ASN
1	A	322	ASN
1	A	609	HIS
1	A	630	ASN
1	A	633	ASN
1	A	663	HIS
1	A	696	ASN
1	A	713	GLN
1	B	4	ASN
1	B	35	ASN
1	B	59	HIS
1	B	117	ASN
1	B	130	GLN
1	B	150	GLN
1	B	183	ASN
1	B	250	GLN
1	B	328	ASN
1	B	456	ASN
1	B	527	HIS
1	B	596	HIS
1	B	661	HIS
1	B	696	ASN
1	B	733	ASN
1	C	40	GLN
1	C	46	HIS
1	C	183	ASN
1	C	250	GLN
1	C	321	ASN
1	C	328	ASN
1	C	630	ASN
1	C	661	HIS
1	C	663	HIS
1	C	696	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](#)

3 non-standard protein/DNA/RNA residues 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
1	NIY	A	731	1	13,15,16	0.94	1 (7%)	13,20,22	1.94	1 (7%)
1	NIY	B	731	1	13,15,16	1.18	1 (7%)	13,20,22	1.84	1 (7%)
1	NIY	C	731	1	13,15,16	1.14	1 (7%)	13,20,22	1.93	3 (23%)

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
1	NIY	A	731	1	-	2/7/10/12	0/1/1/1
1	NIY	B	731	1	-	2/7/10/12	0/1/1/1
1	NIY	C	731	1	-	2/7/10/12	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	731	NIY	CE1-NN	-3.57	1.39	1.45
1	C	731	NIY	CE1-NN	-3.07	1.40	1.45
1	A	731	NIY	CE1-NN	-2.07	1.41	1.45

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	731	NIY	CB-CA-C	-6.34	99.59	111.47
1	B	731	NIY	CB-CA-C	-6.16	99.91	111.47
1	C	731	NIY	CB-CA-C	-5.01	102.07	111.47
1	C	731	NIY	CB-CG-CD1	-3.36	114.67	120.44
1	C	731	NIY	CD2-CG-CD1	2.06	121.42	118.54

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	731	NIY	CD1-CE1-NN-O2
1	A	731	NIY	CZ-CE1-NN-O2
1	B	731	NIY	CA-CB-CG-CD2
1	C	731	NIY	CA-CB-CG-CD1
1	C	731	NIY	CA-CB-CG-CD2
1	B	731	NIY	CA-CB-CG-CD1

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	731	NIY	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	727/761 (95%)	-0.05	9 (1%) 79 73	27, 42, 68, 89	0
1	B	727/761 (95%)	-0.15	4 (0%) 89 86	25, 41, 66, 89	0
1	C	727/761 (95%)	-0.27	2 (0%) 94 93	17, 30, 55, 79	0
2	D	16/20 (80%)	0.75	1 (6%) 20 12	78, 90, 92, 94	0
2	E	16/20 (80%)	0.67	1 (6%) 20 12	69, 82, 93, 93	0
2	F	16/20 (80%)	0.33	0 100 100	64, 78, 84, 85	0
2	P	3/20 (15%)	0.12	0 100 100	33, 33, 36, 42	0
All	All	2232/2363 (94%)	-0.14	17 (0%) 86 81	17, 38, 69, 94	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	6	LEU	6.0
1	A	14	THR	4.4
2	E	372	ASN	4.2
2	D	372	ASN	3.3
1	A	274	PHE	3.1
1	C	297	VAL	3.0
1	B	10	ARG	3.0
1	A	13	SER	2.7
1	A	17	ILE	2.5
1	A	50	TYR	2.4
1	A	296	GLY	2.3
1	B	17	ILE	2.3
1	C	11	ASP	2.2
1	B	9	LYS	2.2
1	A	19	LEU	2.2
1	A	295	GLY	2.1
1	B	296	GLY	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	NIY	A	731	15/16	0.93	0.20	36,41,51,52	0
1	NIY	B	731	15/16	0.94	0.17	32,37,45,46	0
1	NIY	C	731	15/16	0.96	0.15	22,27,39,42	0

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.