

Full wwPDB X-ray Structure Validation Report (i)

Jun 19, 2024 – 01:55 AM EDT

4K0A
Crystal structure of CD4-mimetic miniprotein M48U7 in complex with HIV-1
YU2 gp120
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2013-04-03
2.13 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 (1)) were used in the production of this report:

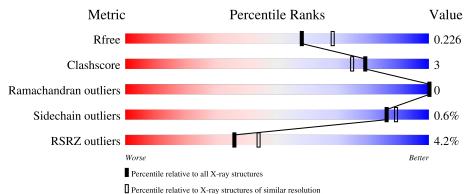
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: $X\text{-}RAY\;DIFFRACTION$

The reported resolution of this entry is 2.13 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	$\begin{array}{c} \textbf{Whole archive} \\ \textbf{(\#Entries)} \end{array}$	${f Similar\ resolution}\ (\#{ m Entries,\ resolution\ range}({ m \AA}))$
R_{free}	130704	2523 (2.16-2.12)
Clashscore	141614	2653 (2.16-2.12)
Ramachandran outliers	138981	2618 (2.16-2.12)
Sidechain outliers	138945	2617 (2.16-2.12)
RSRZ outliers	127900	2485 (2.16-2.12)

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	А	376	87%	10%					
2	R	28	93%						

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	IPA	А	509	-	-	Х	-



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2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 6202 atoms, of which 2985 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.

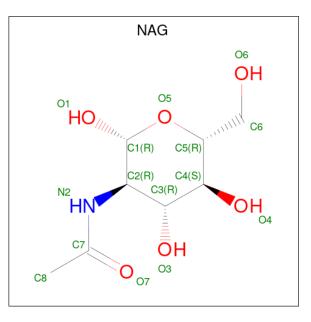
• Molecule 1 is a protein called HIV-1 YU2 gp120 glycoprotein.

Mol	Chain	Residues		Atoms					ZeroOcc	AltConf	Trace
1	А	337	Total 5370	C 1702	Н 2670	N 467	O 508	S 23	0	17	0

• Molecule 2 is a protein called CD4-MIMETIC MINIPROTEIN M48U7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
2	R	28	Total 436	C 145	Н 211	N 39	O 35	S 6	0	4	1

• Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	Λ	1	Total	С	Η	Ν	0	0	0
0	D A	L	27	8	13	1	5	0	0
2	Λ	1	Total	С	Η	Ν	0	0	0
0	A	1	27	8	13	1	5	0	0

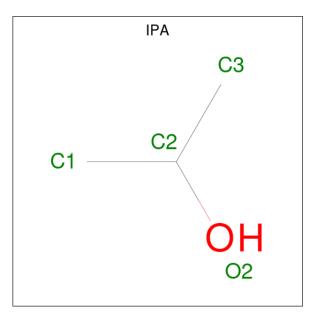
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Mol	Chain	Residues		At	oms			ZeroOcc	AltConf
3	А	1	Total	С	Η	Ν	0	0	0
0	A	1	27	8	13	1	5	0	0
3	А	1	Total	С	Η	Ν	Ο	0	0
5	Л	1	27	8	13	1	5	0	0
3	А	1	Total	С	Η	Ν	Ο	0	0
0	Л	T	27	8	13	1	5		0
3	А	1	Total	С	Η	Ν	Ο	0	0
0	11	1	27	8	13	1	5	0	0
3	А	1	Total	С	Η	Ν	Ο	0	0
0	11	1	27	8	13	1	5	0	0
3	А	1	Total	С	Η	Ν	Ο	0	0
	11	1	27	8	13	1	5		0

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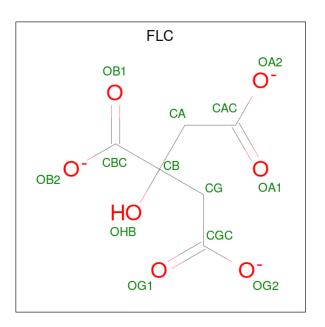
• Molecule 4 is ISOPROPYL ALCOHOL (three-letter code: IPA) (formula: C_3H_8O).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	А	1	$\begin{array}{ccc} \text{Total} & \text{C} & \text{O} \\ 4 & 3 & 1 \end{array}$	0	0
4	А	1	$\begin{array}{ccc} \text{Total} & \text{C} & \text{O} \\ 4 & 3 & 1 \end{array}$	0	0
4	А	1	$\begin{array}{ccc} \text{Total} & \text{C} & \text{O} \\ 4 & 3 & 1 \end{array}$	0	0
4	А	1	$\begin{array}{ccc} \text{Total} & \text{C} & \text{O} \\ 4 & 3 & 1 \end{array}$	0	0

• Molecule 5 is CITRATE ANION (three-letter code: FLC) (formula: $C_6H_5O_7$).





Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	А	1	Total 13	C 6	O 7	0	0

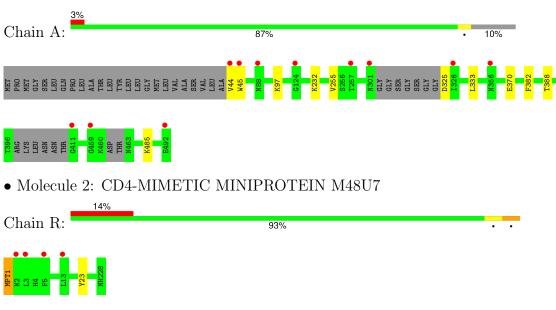
• Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	А	147	Total O 147 147	0	0
6	R	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: HIV-1 YU2 gp120 glycoprotein



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants	65.52Å 164.66Å 78.00Å	Depositor
a, b, c, α , β , γ	90.00° 90.00° 90.00°	Depositor
Resolution (Å)	36.41 - 2.13	Depositor
Resolution (A)	36.41 - 2.13	EDS
% Data completeness	88.4 (36.41-2.13)	Depositor
(in resolution range)	83.6 (36.41-2.13)	EDS
R _{merge}	(Not available)	Depositor
R _{sym}	0.12	Depositor
$< I/\sigma(I) > 1$	-0.39 (at 2.12Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8.2_1309)	Depositor
D D.	0.180 , 0.219	Depositor
R, R_{free}	0.185 , 0.226	DCC
R_{free} test set	1074 reflections $(5.02%)$	wwPDB-VP
Wilson B-factor $(Å^2)$	36.0	Xtriage
Anisotropy	0.419	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$, $B_{sol}(Å^2)$	0.38,44.6	EDS
L-test for twinning ²	$< L >=0.48, < L^2>=0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6202	wwPDB-VP
Average B, all atoms $(Å^2)$	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 5.42% of the height of the origin peak. No significant pseudotranslation is detected.

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.



¹Intensities estimated from amplitudes.

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: FLC, NH2, MPT, 1OP, NAG, DPR, IPA

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
	Unam	RMSZ	# Z > 5	RMSZ	# Z > 5
1	А	0.22	0/2814	0.41	0/3816
2	R	0.23	0/199	0.49	0/261
All	All	0.22	0/3013	0.41	0/4077

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	R	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	R	1	MPT	Mainchain

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	А	2700	2670	2647	13	0
2	R	225	211	235	5	0
3	А	112	104	104	0	0
4	А	16	0	32	7	0
5	А	13	0	5	2	0
6	А	147	0	0	4	0
6	R	4	0	0	0	0
All	All	3217	2985	3023	17	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 3.

All (17) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic	Clash
Atom-1	Atom-2	distance (Å)	overlap (Å)
1:A:97:LYS:HA	4:A:512:IPA:H11	1.63	0.81
1:A:485:LYS:NZ	6:A:724:HOH:O	2.14	0.80
1:A:388:THR:OG1	6:A:728:HOH:O	2.01	0.77
1:A:325:ASP:N	6:A:735:HOH:O	2.17	0.77
1:A:45:TRP:H	4:A:509:IPA:H11	1.58	0.69
1:A:255:VAL:HG12	2:R:23[A]:10P:H1	1.80	0.61
1:A:45:TRP:CG	4:A:509:IPA:H2	2.39	0.58
1:A:370:GLU:HB3	2:R:23[B]:10P:H13	1.85	0.57
5:A:513:FLC:OA2	5:A:513:FLC:HG1	2.08	0.52
1:A:44:VAL:HG13	4:A:509:IPA:H11	1.93	0.51
1:A:45:TRP:H	4:A:509:IPA:C1	2.23	0.50
1:A:45:TRP:N	4:A:509:IPA:H11	2.26	0.46
5:A:513:FLC:OG2	6:A:711:HOH:O	2.20	0.46
1:A:44:VAL:HA	4:A:509:IPA:H11	2.01	0.43
2:R:23[B]:10P:H4	2:R:23[B]:10P:H16	1.84	0.41
1:A:382:PHE:CD1	2:R:23[B]:10P:H3	2.56	0.41

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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



Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	entiles
1	А	345/376~(92%)	338~(98%)	7~(2%)	0	100	100
2	R	27/28~(96%)	26~(96%)	1 (4%)	0	100	100
All	All	372/404~(92%)	364 (98%)	8 (2%)	0	100	100

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

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	А	312/328~(95%)	310 (99%)	2(1%)	86 89
2	R	23/20~(115%)	23 (100%)	0	100 100
All	All	335/348~(96%)	333~(99%)	2(1%)	86 89

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	А	232	LYS
1	А	333	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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	Link	Bo	ond leng	ths	В	ond ang	les
MOI	туре	Ullalli	nes	LIIIK	Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z >2
2	10P	R	23[B]	-	17,18,19	0.50	0	16,21,23	0.63	0
2	10P	R	23[A]	-	17,18,19	0.49	0	16,21,23	0.64	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
2	10P	R	23[B]	-	-	3/12/13/15	0/1/1/1
2	10P	R	23[A]	-	-	4/12/13/15	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	R	23[B]	10P	CE2-CZ-O1-C07
2	R	23[B]	10P	CE1-CZ-O1-C07
2	R	23[A]	10P	CE1-CZ-O1-C07
2	R	23[A]	10P	CE2-CZ-O1-C07
2	R	23[A]	10P	O1-C07-C08-C09
2	R	23[B]	10P	C09-C10-C11-O2
2	R	23[A]	10P	C08-C09-C10-C11

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	R	23[B]	10P	3	0
2	R	23[A]	10P	1	0



5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

13 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	Trune	Chain	Res	Link	Bo	ond leng	ths	В	ond ang	les
	Type	Chain	nes	LIIIK	Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	А	501	1	$14,\!14,\!15$	0.18	0	17,19,21	0.52	0
4	IPA	А	511	-	3,3,3	0.60	0	3,3,3	0.32	0
3	NAG	А	502	1	$14,\!14,\!15$	0.26	0	17,19,21	0.47	0
3	NAG	А	504	1	14,14,15	0.24	0	17,19,21	0.39	0
3	NAG	А	503	1	14,14,15	0.20	0	17,19,21	0.42	0
5	FLC	А	513	-	12,12,12	1.19	1 (8%)	$17,\!17,\!17$	1.18	1 (5%)
3	NAG	А	505	1	14,14,15	0.19	0	17,19,21	0.44	0
4	IPA	А	512	-	3,3,3	0.59	0	3,3,3	0.32	0
3	NAG	А	507	1	14,14,15	0.29	0	17,19,21	0.33	0
4	IPA	А	509	-	3,3,3	0.59	0	3,3,3	0.32	0
4	IPA	А	510	-	3,3,3	0.51	0	3,3,3	0.19	0
3	NAG	А	508	1	14,14,15	0.23	0	17,19,21	0.44	0
3	NAG	А	506	1	14,14,15	0.33	0	17,19,21	0.36	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
3	NAG	А	501	1	-	2/6/23/26	0/1/1/1
3	NAG	А	502	1	-	2/6/23/26	0/1/1/1
3	NAG	А	504	1	-	0/6/23/26	0/1/1/1
3	NAG	А	503	1	-	0/6/23/26	0/1/1/1
5	FLC	А	513	-	-	11/16/16/16	-
3	NAG	А	505	1	-	0/6/23/26	0/1/1/1

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Mol	Ű	Chain	1 0		Chirals	Torsions	Rings
3	NAG	А	507	1	-	2/6/23/26	0/1/1/1
3	NAG	А	508	1	-	2/6/23/26	0/1/1/1
3	NAG	А	506	1	-	0/6/23/26	0/1/1/1

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All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	А	513	FLC	CB-CBC	-2.33	1.51	1.53

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms Z		$Observed(^{o})$	$Ideal(^{o})$
5	А	513	FLC	OB2-CBC-CB	2.92	118.74	113.14

There are no chirality outliers.

All (19) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	А	513	FLC	CA-CB-CBC-OB1
5	А	513	FLC	CA-CB-CBC-OB2
5	А	513	FLC	OHB-CB-CBC-OB1
5	А	513	FLC	OHB-CB-CBC-OB2
3	А	508	NAG	O5-C5-C6-O6
3	А	508	NAG	C4-C5-C6-O6
3	А	501	NAG	C8-C7-N2-C2
3	А	501	NAG	O7-C7-N2-C2
3	А	502	NAG	C8-C7-N2-C2
3	А	502	NAG	O7-C7-N2-C2
3	А	507	NAG	O5-C5-C6-O6
5	А	513	FLC	CB-CA-CAC-OA1
5	А	513	FLC	CB-CA-CAC-OA2
3	А	507	NAG	C4-C5-C6-O6
5	А	513	FLC	CBC-CB-CG-CGC
5	А	513	FLC	OHB-CB-CG-CGC
5	А	513	FLC	CG-CB-CBC-OB1
5	А	513	FLC	CG-CB-CBC-OB2
5	А	513	FLC	CA-CB-CG-CGC

There are no ring outliers.

3 monomers are involved in 9 short contacts:



Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	А	513	FLC	2	0
4	А	512	IPA	1	0
4	А	509	IPA	6	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 (i)

6.1 Protein, DNA and RNA chains (i)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	$\langle RSRZ \rangle$	#RSRZ>2	$OWAB(Å^2)$	Q < 0.9
1	А	337/376~(89%)	0.31	11 (3%) 46 54	24, 38, 75, 98	0
2	R	24/28~(85%)	0.77	4 (16%) 1 2	33, 66, 95, 109	0
All	All	361/404~(89%)	0.34	15 (4%) 36 44	24, 39, 79, 109	0

All (15) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	А	44	VAL	11.2
1	А	492	GLU	6.5
1	А	301	ASN	6.1
2	R	5	PHE	5.1
1	А	411	GLY	4.7
2	R	13	LEU	3.7
1	А	326	ILE	3.3
1	А	356	ASN	3.2
1	А	124	GLY	3.1
2	R	2	ASN	2.6
1	А	459	GLY	2.3
2	R	3	LEU	2.3
1	А	88	ASN	2.2
1	А	257	THR	2.2
1	А	45	TRP	2.1

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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.



Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	10P	R	23[A]	18/19	0.95	0.17	$27,\!34,\!37,\!40$	6
2	10P	R	23[B]	18/19	0.95	0.17	30,35,38,40	6
2	DPR	R	21	7/8	0.96	0.10	30,35,39,39	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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	$\mathbf{B} ext{-factors}(\mathbf{A}^2)$	Q<0.9
4	IPA	А	510	4/4	0.72	0.26	45,49,52,53	0
4	IPA	А	509	4/4	0.75	0.20	$56,\!62,\!66,\!75$	0
3	NAG	А	503	14/15	0.76	0.29	78,90,108,108	0
5	FLC	А	513	13/13	0.83	0.21	$55,\!101,\!109,\!117$	0
4	IPA	А	512	4/4	0.86	0.27	68,70,70,71	0
3	NAG	А	508	14/15	0.88	0.25	58,76,96,106	0
3	NAG	А	507	14/15	0.89	0.13	$50,\!80,\!97,\!103$	0
3	NAG	А	506	14/15	0.91	0.22	51,64,86,102	0
3	NAG	А	502	14/15	0.92	0.20	62,82,101,101	0
3	NAG	А	504	14/15	0.93	0.12	$28,\!36,\!50,\!57$	0
4	IPA	А	511	4/4	0.93	0.18	54,62,63,67	0
3	NAG	А	505	14/15	0.94	0.11	48,61,74,74	0
3	NAG	А	501	14/15	0.96	0.14	$36,\!51,\!65,\!77$	0

6.5 Other polymers (i)

There are no such residues in this entry.

